AppleWorks Forum

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Support for AppleWorks and ///EZ Pieces Users

Making Better Use of a RamFactor

Dear NAUG:

I have four megabytes of RAM on my RamFactor card, but AppleWorks only uses two megabytes of this memory for its desktop. The rest goes unused. However, if I use the remaining portion of the card as a RAM disk, AppleWorks crashes during bootup.

Can you explain this problem and help me get full use of the card?

Robert Quetel
West New York, New Jersey

[John Link responds: Here is a way to use a RamFactor both to expand AppleWorks' desktop memory and to serve as a RAM disk. The procedure uses TimeOut FileMaster to manage the RAM disk from within AppleWorks. Follow these steps:

1. *Un-modified copies of AppleWorks automatically use the first two megabytes of memory on the RamFactor for the AppleWorks desktop. If you want to limit the size of the AppleWorks desktop, use SuperPatch or the AW 3.0 Companion to patch AppleWorks so it uses the amount of desktop memory you specify.*
2. *Run AppleWorks and configure the program so it loads all its modules upon bootup.*
3. *Shut down your computer for at least five minutes.*
4. *If you have a battery backup on the RamFactor and want to use the card as a boot device, boot your computer and use any utility program to format the card. (If you have a floppy disk system, boot your computer with Copy II+ or any comparable utility program. Then format the RamFactor.) Skip this step if you do not have a battery backup or if you do not want to boot your system from the RamFactor.*
5. *Launch AppleWorks and use TimeOut FileMaster to create any subdirectories you want on the RamFactor, then copy your programs and data files onto the card. You should also copy AppleWorks and its spelling dictionaries onto the RamFactor to speed up spell checking. (Note: Do not copy AppleWorks GS or other 16-bit applications that use forked files onto the RAM disk.)*
6. *Quit AppleWorks. If you continue to run AppleWorks, the program will look on your floppy or hard drive for the spelling dictionaries. Spell checking is faster when you run the dictionaries from the RamFactor.*

You can now launch AppleWorks or any other program stored on the RamFactor or on disk. However, you can only use FileMaster to copy, delete, and otherwise manage the files on the RAM disk. Do not save files or increase the size of the files stored on the RamFactor when you are not running AppleWorks.

You probably guessed by now that you have to preserve the first blocks of memory in the RamFactor for AppleWorks. AppleWorks uses that space to store a file called SYS.DESKTOP. Since SYS.DESKTOP occupies those blocks when you run AppleWorks, FileMaster cannot store other files in that portion of memory. However, AppleWorks deletes SYS.DESKTOP when you quit the program and leaves those blocks available for other files. Then ProDOS uses those blocks for the next new file you want to store on the card. As a result, if you have more than two megabytes of

The ***National AppleWorks Users Group*** **(NAUG)** is an association that supports AppleWorks users. **NAUG** provides technical support and information about AppleWorks and enhancements to that program. Our primary means of communicating with members is through the monthly newsletter entitled the ***AppleWorks Forum.***

AppleWorks Forum

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memory on the RamFactor, AppleWorks cannot find room for SYS.DESKTOP and your system crashes the next time you launch the program.

Here are two way to make it easier to manage the files on your RamFactor:

1. *Leave your computer on. Each time you turn on the power you will have to rebuild the files on the RamFactor. By leaving your system on you will extend the life of the computer and make it easier to use your system.*
2. *Use the backup programs supplied with EasyDrive, RamUp, or ProSel-8 to make an "image" backup of the RamFactor. Then use the image of the card to rebuild the file structure. Note that utility programs such as ProSel-16 and Apple's Backup II only make file-by-file backups. You cannot use these programs for this operation.]*

Figure 1: Sample Word Processor Display

```
File: EXAMPLE                REVIEW/ADD/CHANGE                Escape: Main Menu
=====<====<====<====<====<====<====<====<====<====<====<====<====<====<====

——Indent: 4 chars
——Group Begin
1.  When you turn on a Widget microcomputer it says "READY". Where does it
    store the information necessary for it to respond "READY" when you turn
    it on?
——Left Margin:  1.4 inches
    A.  in ROM.
    B.  in RAM.
    C.  in the microprocessor.
    D.  in the disk operating system.
    E.  on the floppy disk.
——Group End

Type entry or use Ó commands Line 33  Column  5                  Ó-? for Help
```

Why You Cannot Delete a Return Blot

Dear Cathleen,

I usually have few problems using the AppleWorks 3.0 word processor. However, once in a while I cannot delete a Return "blot" from a document. I try everything including putting the cursor after the blot and pressing the Delete Key, putting the cursor on the blot and issuing an Apple-Delete, and using the Apple-D command. Nothing works. Is this a bug in AppleWorks?

Sue Carlisle
Augusta, Georgia

[Ed: Certain AppleWorks word processor formatting commands (like characters per inch, indent, and left and right margins) must appear at the beginning of a paragraph. If you try to invoke those commands in the middle of the paragraph, AppleWorks automatically places the command at the beginning of that paragraph. AppleWorks also insures that these commands stay at the beginning of the paragraph. That is, except for the first paragraph in a document, there must be a Return "blot" immediately before the command. The program protects you by not letting you delete that Return.

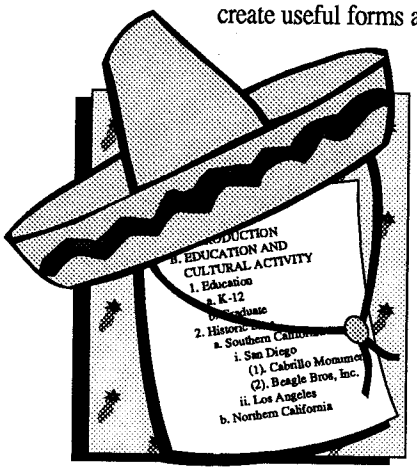
Figure 1 presents an example to help you visualize this problem. The multiple choice test item in this figure includes Return characters at the end of the test item and after each choice. You can delete all the Returns except the one immediately in front of the Left Margin 1.4 inches command. The Return in front of the Left Margin command defines the beginning of a new paragraph, and since the Left Margin command must appear at the beginning of a paragraph, AppleWorks will not let you remove that Return.

The cause of this problem becomes obvious when you have the formatting commands on the display, but is less apparent when you hide the commands from view.

To delete the Return "blot", zoom in so the formatting commands appear on the screen and issue an Apple-D command to delete both the "blot" and the command.]

Three Amigos for Your AppleWorks Word Processor

Beagle Bros introduces three new products that enhance your AppleWorks Word Processor. Outline a term paper, create useful forms and learn how to develop innovative lesson plans—all without leaving AppleWorks.



Outline and Thought Processing Made Easy

This exciting productivity tool brings outline processing to AppleWorks 3.0. Outliner for AppleWorks 3.0 lets you organize information up to six levels deep. Use it to create to-do lists and tests, prepare curriculum, generate lesson plans, organize class notes, write a term paper and more. Any information that you organize into different topics or levels can be processed with Outliner. ***$69.95***

Outliner for AppleWorks 3.0 requires a 128K Apple IIe, IIc, IIc+ or IIGS with at least one 3.5" or 5.25" disk drive and AppleWorks 3.0.

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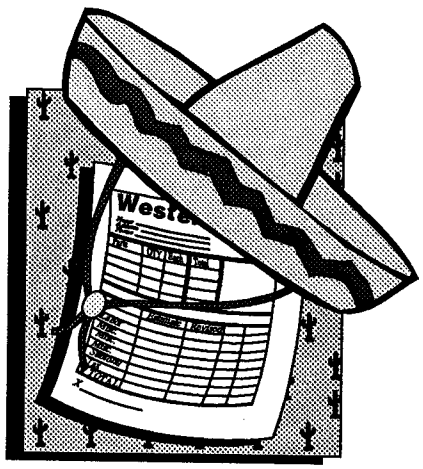
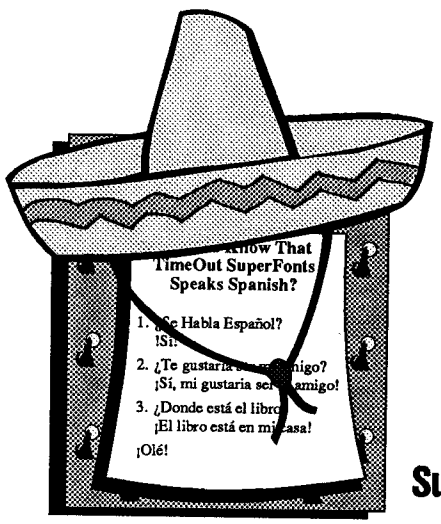
TimeOut SuperForms requires a 128K Apple IIe, IIc, IIc+ or IIGS with a 3.5" or 5.25" disk drive and AppleWorks 3.0 with TimeOut SuperFonts.



TimeOut SuperForms™



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SuperFonts Activity Guide requires AppleWorks 2.0, 2.1 or 3.0 with TimeOut SuperFonts.

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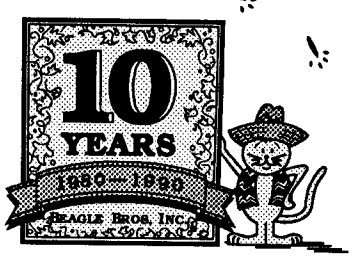

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How to Use @IRR

by Stan Hecker

This is the first in a series of articles that describe how to use the financial functions in the AppleWorks spreadsheet module. This month, Mr. Hecker describes how to compute and interpret the Internal Rate of Return.

The release of AppleWorks 3.0 added 26 functions that enhance the power and functionality of the program's spreadsheet module. This month I will describe AppleWorks' "Internal Rate of Return" (@IRR) function. @IRR is arguably the most complicated, powerful, and useful of the new financial functions added to the current version of AppleWorks.

I will start with a quick review of some terminology and some simple calculations.

Terminology

Simple Interest: Imagine that you put $100 in a savings account that pays 5% interest. In a year, you draw out the five dollars interest you earned on that account. At the end of the second year, the bank will give you another five dollars in interest. That is simple interest.

Although simple interest may seem too easily understood to merit attention, calculating simple interest offers an easy way to verify a financial calculation. For example, if you are buying and selling stock or starting a business, it is useful to know that you will double your money in 10 years at 10% simple interest, five years at 20%, four years at 25%, and less than 3 years at 35%. You might have grounds to mistrust a stockbroker or a spreadsheet function that claims to return better than 25% each year but does not show a doubling of your money in four years. Two examples that use these estimates appear later in this article.

Compound Interest: If you leave $100 in the bank at 5% for two years without withdrawing the interest, you earn compound interest; you would get at least $10.25 in interest, not the $10 you might expect. That is because the $5 in interest you earned the first year itself earns interest during the second year.

"Compounding" can put a lot of extra money in your account. The differences are particularly dramatic when you earn higher interest rates. Here is a rough memory aide: With annual compounding, seven percent interest doubles your initial investment in approximately ten years; ten percent doubles your money in seven years.

Decimal Fractions: A percentage is a comparison to a common base of 100. That is, 25% means 25 out of 100. A decimal fraction is a comparison to a common base of one. That is, .25 means ".25 times one". You express the percentage figure of "10.25%" as the decimal fraction ".1025".

"@IRR is the most powerful and useful new function in AppleWorks."

All AppleWorks financial functions require that you enter interest rates as decimal fractions. AppleWorks also displays all results in the decimal fraction format, although you can set the cell format to "Percentage Format" with one decimal place and AppleWorks will convert all decimal numbers to percentages. However, you must enter decimal fractions (or an expression which yields a decimal fraction) whenever you create a formula that uses any financial function.

Stream of Payments: If you borrow $1,000 and repay the loan in 48 monthly payments, you have agreed to give the bank a stream of payments. In reality, the bank is willing to pay you $1,000 right now in exchange for a fixed, level stream of payments.

Figure 1: Simple Loan Example Using @IRR

```
File: PERS.LOAN              REVIEW/ADD/CHANGE            Escape: Main Menu
================A================B========C========D========E========F===
 1|
 2|--------------------------- A PERSONAL LOAN ---------------------------
 3|
 4|
 5|                    YEAR:      START     FIRST     SECOND    THIRD     FOURTH
 6|
 7|The Loan:                    -1500.00
 8|
 9|The Repayment:
10|   Interest                              120.00    120.00    120.00    120.00
11|   Principal                                                           1500.00
12|
13|CASH FLOW                    -1500.00    120.00    120.00    120.00   1620.00
14|
15|
16|Calculated IRR:                  .08
17|
18|
------------------------------------------------------------------------------
B16: (Value) @IRR(B13...F13,0.05)
Type entry or use Ó commands                                    Ó-? for Help
```

Few transactions in life are so steady and level. Consider your credit card. When it is new, the bank advances you a stream of payments in various stores. The flow is uneven; $10 here, $100 somewhere else, and nothing at all for a while. At the end of the month, you reverse the stream. If you were unwise, the stream may have to trickle back to the bank for many months. Obviously, your credit card can create a turbulent and treacherous "stream of payments". Nevertheless, the experts still consider these transactions a stream of payments.

Internal Rate of Return: In layman's terms, internal rate of return is the overall rate of return on an investment. The IRR compares the total amount of money going out with the total amount of money coming in and reflects the actual interest rate being earned.

More technically, "Internal Rate of Return is the rate of return which equalizes the value of the stream of investments with the stream of discounted income."

Standard interest rates such as mortgages, savings, and car loans are excellent for describing steady streams of even payments. You can also use the Internal Rate of Return to measure such payments; the calculations give the same result you get when you compute the simple and compound interest rates. But when a stream of payments climbs and dives, as it might when you consider a real estate investment, common interest rates do not correctly reflect these changes. Internal Rate of Return excels at equalizing and comparing uneven streams of payments.

The @IRR function compresses a substantial amount of tedious financial algebra into a few keystrokes. Several financial options can be compared to each other, and we can draw conclusions from the comparisons — just as we do when we argue miles-per-gallon, batting averages, and similar, indirect measures of performance.

An Example

An example should clarify these concepts.

Imagine that you loan me $1,500 today. In return, I promise to pay $120 interest on each anniversary of the loan and to repay the original amount on the fourth anniversary of the loan. What rate of return am I offering you?

First, note that this is a steady, level stream of payments that can be handled as a simple interest problem with pencil and paper or a pocket calculator. Nevertheless, we can also use the powerful @IRR function to calculate the simple interest rate, even though the results will match the simple interest calculations. *Figure 1* depicts a spreadsheet that uses the @IRR function to calculate the Internal Rate of Return of this investment.

The "Start" column in *Figure 1* shows that you lent me $1500. The columns labelled "First", "Second", and so on, show my payments to you. Note that the spreadsheet also includes my repayment of the principal: You must include all transactions for the @IRR function to work properly.

Row 13, labelled "Cash Flow", shows the movement of cash from your perspective. First, you give me $1500, which appears in row 13 as -1500.00, because it is money out of your pocket. Then, the spreadsheet shows my three $120 payments to you.

Since these go into your pocket, the payments are positive numbers. The number in cell F13 shows my final payment to you; the $1500 repayment and the $120 annual interest payment.

Cell B16 contains the result of the @IRR calculation. If you loaned me money under the terms described here, the Internal Rate of Return would be .08, or 8 percent.

In this case, given a flow of equal cash payments and a prompt repayment of principal, the Internal Rate of Return is exactly equal to the simple interest rate.

The Syntax of @IRR

@IRR formulas must follow this syntax:

```
@IRR(cashflow range, interest rate guess)
```

The "cashflow range" is the list (row or column) of all the payments in the total life of the financial arrangement, agreement, or venture. In *Figure 1*, cells B13 to F13 contain all the financial transactions in our agreement; the payment you make to me and the payments I make to you. That is the "cashflow range" the @IRR function will use in its calculations.

The "interest rate guess" is your best guess of the annual interest rate you pay or earn. For example, imagine that I propose to borrow $1,000 from you and pay you $300 each year for five years. I would pay back a total of $1,500 on your $1000 loan, or 50% more than I borrow. However, .50 (50%) is not a reasonable interest rate guess because it represents the total interest earned over five years. Perhaps you might want to try .1 (10%) as the annual interest rate guess; 50% divided by 5. In this case, the @IRR function will calculate the correct rate of return with any estimate between 0% and 40%.

Although it might seem strange for a computer program to "ask" for your guess about a solution to a mathematics problem, the "interest rate guess" serves as a starting point for AppleWorks. The program starts its iterative calculations based on your guess. The more accurate your guess, the faster AppleWorks can calculate the underlying Internal Rate of Return.

In addition, the "interest rate guess" serves as a safety feature. If AppleWorks finds your guess unreasonable, the program assumes that something is wrong and displays an error message. I will discuss those messages later in this article.

Note that if you omit the "interest rate guess" from the @IRR expression (e.g., if you write the formula as @IRR(B13...F13) without any interest rate guess at all) AppleWorks will assume an interest rate guess of 10%.

In the example in *Figure 1*, the "cashflow range" consists of the five cells that contain the annual exchange of cash between us. The "interest rate guess" is .05, or 5%; a reasonable estimate of the interest rate I promised to pay you. AppleWorks responds by saying, "Your interest rate guess of 5% was a bit low, but it is close enough for me to understand the problem. The true Internal Rate of Return is .08, or 8%."

A Second Example

Now let's assume that you put the $1,500 into a savings account or a money market fund instead of lending it to someone.

Figure 2 shows your $1,500 deposit and interest compounding every year for four years at 8% annual interest. The @IRR function shows that the true Internal Rate of Return for your investment is the 8% interest rate paid by the bank or fund.

Of course, banks generally pay interest more often than annually and money-market fund yields vary from year to year, so these calculations are estimates and are not precise. However, the principle remains the same.

However, consider this question: "The loan calculation in *Figure 1* yields a total interest of $480 on an investment of $1,500 over four years. The calculation in *Figure 2* yields a total interest of $540.74. How can both yield an 8% Internal Rate of Return?"

These results occur because the Internal Rate of Return considers the "time value" of money. That is, getting $120 this year is worth more than getting $120 next year. Thus, your calculations show that getting $120 each year is identical in value to getting $540.74 at the end of four years.

Figure 2: Example of Compound Interest

```
File: COMPOUNDING              REVIEW/ADD/CHANGE              Escape: Main Menu
==================A=================B========C========D========E========F==
   1|
   2|
   3|---------------------------- BANK INTEREST ----------------------------
   4|
   5|
   6|BUSINESS YEAR:                    START   FIRST    SECOND     THIRD    FOURTH
   7|
   8|The Deposit:                   -1500.00
   9|
  10|The Yearly Interest:                    120.00    129.60    139.97    151.17
  11|
  12|Deposit Withdrawn:                                                   1500.00
  13|
  14|CASH FLOW                      -1500.00    0.00      0.00      0.00   2040.74
  15|
  16|
  17|Calculated IRR:                    .08
  18|
--------------------------------------------------------------------------------
A21 (Value) @IRR(B14...F14)
Type entry or use ⌂ commands                                        ⌂-? for Help
```

A Business Example

Now, let's look at a more complicated example that uses the @IRR function to help you make a business decision.

Imagine that you are starting a small software business that will distribute a set of AppleWorks templates you developed. You know that you will need about $800 to start the project; you plan to take that money from your money market fund which earns 8% interest.

In addition, you need the time to start and run the business. You plan to give up some overtime at your "real" job; extra work that brings in $15 per hour. In this example, let's assume that you generally invest these overtime wages in the money market account.

A nagging thought remains, however. Wouldn't it be more sensible to work the overtime and watch the money market account grow? Is your little software business a potential moneymaker or just an ego-builder? Let's use the @IRR function in the AppleWorks spreadsheet module to find out.

The Assumptions

You have to make some assumptions to build your model. For example, you will assume that you will operate the business for five years and will not be able to sell the business when you are done. You will also assume that you can sell your product for $15 per disk. You expect to sell 50 disks the first year, 100 disks the second year, and 125 each following year. You expect to spend 100 hours on the work the first year and 50 hours each following year. Finally, you expect to spend $500 to get the business started the first year and $300 for advertising, diskettes, postage, and other general expenses each year, including the first year.

Figure 3 presents a spreadsheet that contains the details of each year you expect to be in business. The data in row 19 summarize your profit and loss for each year.

Interest Rate Guess

I set the interest rate guess in this example to .08, which is the nominal 8% that the alternate investment (the money market fund) will produce. In doing so, I didn't have any idea about the true Internal Rate of Return of the software venture. Such a strange assortment of losses and gains is difficult to estimate or calculate by conventional means. All I want to know is if the Internal Rate of Return is higher for the software venture than for the money market fund.

Don't Beg the Question

The question remains: Does this series of losses and modest profits exceed your overtime earnings and the 8% per year you would earn by putting these earnings in the money market fund?

The answer is yes. Cell B21 in *Figure 3* shows that this business will net far more than 8%. If your assumptions are correct, your software business will yield an Internal Rate of Return of .2819862, which rounds to 28.2%.

Clearly, the software venture will be profitable if sales hold up to expectations. In fact, measured by the Internal Rate of Return, the software venture

will be more than three times as profitable (28.2% compared to 8%) as accumulating the overtime pay in the money market fund.

That is how high-powered financial experts compare the choices available to their corporate employers. The Internal Rate of Return is so firmly established in this role that the experts argue about the underlying cost and sales assumptions, not about using the Internal Rate of Return function.

Figure 3: An Analysis of a Small Business Start-Up

```
File: BUSINESS.START          REVIEW/ADD/CHANGE              Escape: Main Menu
==========A=====================B========C========D========E========F=======
 1|
 2|----------------------Starting A Software Venture ----------------------
 3|
 4| BUSINESS YEAR:              FIRST    SECOND    THIRD   FOURTH    FIFTH
 5|
 6| COSTS
 7| Overtime Hours Lost          (100)     (50)     (50)     (50)     (50)
 8| Pay Lost                    -1500    -750     -750     -750     -750
 9| Recurring Costs              -300    -300     -300     -300     -300
10| Startup $ (M-M acct)         -500
11|TOTAL COSTS                  -2300   -1050    -1050    -1050    -1050
12|
13|SALES
14|Units Sold                     50     100      125      125      125
15|Unit Price                    15      15       15       15       15
16|TOTAL SALES                   750    1500     1875     1875     1875
17|
18|TOTAL SALES MINUS
19|     TOTAL COSTS:            -1550     450      825      825      825
20|
21|Calculated IRR:           .2819862
22|
--------------------------------------------------------------------------------
B21: (Value) @IRR(B19...F19,.08)
Type entry or use ⌂ commands                                    ⌂-? for Help
```

Finding and Correcting Mistakes

Developers generally make two types of errors when producing financial models: syntax errors and logic errors. AppleWorks will usually not accept formulas with syntax errors. When you try to enter the formula, AppleWorks beeps, erases the formula from the entry line, and either leaves the cell blank or restores the earlier contents of the cell you tried to change. Thus, you generally do not have to worry about syntax errors when you prepare formulas that use the @IRR function.

However, until you get a thorough understanding of the concepts of Internal Rate of Return, cash-flow range, and interest rate guess, you are likely to make logical errors when using the @IRR function. Sometimes these errors will generate an ERROR message; at other times they generate an incorrect answer.

ERROR messages generally result from one of three logical errors. The first possibility is that you did not include all the transactions in the "cashflow range". AppleWorks cannot calculate an accurate Internal Rate of Return with incomplete information. Check to insure that you included all the cash flow in the transaction, including the startup costs of a new venture and any final payoff.

The second possibility is that your spreadsheet shows both incoming and outgoing cash as positive numbers. You should enter all outgoing cash as a negative number, and incoming cash as a positive number. If you follow this convention, the @IRR function will return a positive value if you will make money, a negative value if you will lose money. Make certain that each cell in your "cash-flow range" has a positive or negative value or the value of zero.

The third possibility is that your interest rate guess is wildly optimistic or pessimistic. Try changing your interest rate guess up or down by 25% or 30%. After no more than a few tries, the @IRR function will suddenly give you a numerical result instead of the word ERROR.

Examine the Results

As with all spreadsheet formulas, it is important to examine the output to determine if the results are reasonable. For example, if the @IRR function returns a value of .92 (which converts to 92%), you should check if your data supports the conclusion that you are nearly doubling your money annually.

Once you have experience with Internal Rate of Return, you will be able to determine the reasonableness of the answer by examining the results,

Figure 4: A Model Based on Reduced Sales Volume

```
File: BUSINESS.START          REVIEW/ADD/CHANGE              Escape: Main Menu
==========A==================B========C========D======= E========F======
 1|
 2|---------------------Starting A Software Venture ----------------------
 3|
 4| BUSINESS YEAR:              FIRST    SECOND    THIRD    FOURTH    FIFTH
 5|
 6| COSTS
 7| Overtime Hours Lost          (100)     (50)     (50)      (50)     (50)
 8| Pay Lost                    -1500     -750     -750      -750     -750
 9| Recurring Costs              -300     -300     -300      -300     -300
10| Startup $ (M-M acct)         -500
11|TOTAL COSTS                  -2300    -1050    -1050     -1050    -1050
12|
13|SALES
14|Units Sold                     50      100      100       100      100
15|Unit Price                    15       15       15        15       15
16|TOTAL SALES                   750     1500     1500      1500     1500
17|
18|TOTAL SALES MINUS
19|     TOTAL COSTS:            -1550      450      450       450      450
20|
21|Calculated IRR:              .062616
22|
--------------------------------------------------------------------------
B21: (Value) @IRR(B19...F19,.08)
Type entry or use Ó commands                                  Ó-? for Help
```

much as you can estimate an average by looking over a column of numbers. Until you can determine a rough estimate of the expected answer, you should do some calculations to determine if your Internal Rate of Return is reasonable.

Determining a Reasonable Estimate

The Internal Rate of Return in *Figure 3* is 28%. To determine if that result is reasonable, mentally round it down to 25% and think through the following logic:

"I plan to put about $1,500 of money and effort into this business by the end of the first year. That leaves four years to make some money. If I gave someone a loan at 25% simple interest, one payment a year, how much interest would they pay me in four years?

"At 25% per year for four years, the borrower would pay interest that is approximately equal to the amount of the loan itself, no matter how big the loan. In addition, the borrower would have to pay back the principal.

"But what if I made an arrangement like a mortgage, where the principal was also paid back a little at a time? Then I would have my interest and my principal back at the end of four years. At that time, I would have doubled my money.

"Now let's compare this to the spreadsheet. I would get back $450 the second year, plus $825 each year for three years. That adds up to $2,925. Yes, that is about double the $1,550 I invested the first year. Thus, the Internal Rate of Return on the spreadsheet seems reasonable."

Such rough-estimate verification is extremely important when using any financial function, particularly the @IRR function. When the stream of payments is uneven, reverses itself, and dries up some years, you want to be reasonably sure that you entered everything correctly and included all the variables. After all, it is your money you are considering.

A Wolf at the Door?

The findings in *Figure 3* indicate that your business will pay you triple what you would earn if you left your money in the money market fund and worked overtime. But what happens if your assumptions are wrong? For example, what will happen if you sell 100 disks a year instead of the 125 disks you estimated earlier?

The spreadsheet in *Figure 4* depicts the results of this calculation. All I did was lower the sales in the third, fourth, and fifth years; the spreadsheet did the rest. As you can see, this slight change in sales has a dramatic impact on the Internal Rate of Return, which drops from approximately 28% to about 6%. These results suggest that if you sell 100 units a year, you will make only 6% by running your business. Since the money market fund provides an 8% Internal Rate of Return, perhaps you should not take the risks necessary to prepare and sell your disks.

More What-If Questions

One of the advantages of the AppleWorks spreadsheet is that it encourages you to test different scenarios. For example, you can use the models in *Figures 3* and *4* to answer the following questions:

— What will happen if I charge $20 per disk instead of $15?

— What will happen if a 20% increase in sales increases my time spent on the business by 10%?

— Should I spend an extra $500 a year on advertising if that advertising generates an additional 50 sales per year?

— What sales volume do I need to break even, ignoring interest on the money-market account? (That is, what sales volume do I need to make an Internal Rate of Return of 0%).

— How many sales do I need if I cut the unit price to $10 per disk?

— How many sales do I need if I give **NAUG** members a $5 discount?

— What happens if my fixed costs and overtime wages each go up by 5% per year?

A few changes to the spreadsheet provide immediate answers to these and other important business planning questions.

Notes for Experts

Expert readers might note that *Figure 2* does not flow directly into *Figure 3*. Specifically, the effect of yearly annuity-type deposits of $750 will raise the Internal Rate of Return of *Figure 2* substantially. A useful exercise for such readers is to expand *Figure 2* to include four such deposits; the calculated @IRR will increase to about 13.5%, which is still substantially lower than the calculated @IRR in *Figure 3*.

Additionally, financial experts may want to try some test cases to see if you can use fractional interest rates within @IRR to calculate correct Internal Rates of Return for erratic monthly or quarterly cashflows. The rest of us would be wise to stay with net annual cashflows and annual interest rate guesses, which are the common assumptions.

Similarly, the @IRR function assumes that cashflows occur at the end of the period. That is, the formulas assume that each annual payment is received at the end of the year. Expert users can develop templates that weigh cashflows between beginning and ending remittances for greater accuracy. Less expert users should follow the common assumption of end-of-year remittances.

Conclusion

It is obvious that the @IRR function adds significant power to the AppleWorks spreadsheet module. Changing the spreadsheet in *Figures 3* and *4* takes less than a minute and can generate answers to important business questions. Comparable calculations by hand or with a pocket calculator involve hours of work, intimidating formulas, and difficult arithmetic operations.

[Stan Hecker is on the administrative staff at Michigan State University, East Lansing, Michigan. The author thanks Robert Netro, a business consultant from Canton, Ohio for his critical review of this manuscript.]

UltimateWorks

NAUG's UltimateWorks members automatically receive the *AppleWorks Forum* and every book, catalog, and public domain disk produced by NAUG. During the past year, UltimateWorks members received 12 issues of the AppleWorks Forum, two books, two booklets, and 43 public domain disks. Purchased individually these items cost $370. UltimateWorks memberships cost $99 ($8.25 per month) without NAUG on Disk, $149 ($12.42 per month) with NAUG on Disk.

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Enhancements to UltraMacros' Default Macros

by William Neef

The UltraMacros disk includes MACROS ULTRA3.0, a word processor file that contains macros you can customize, compile, and define as your default macro set for AppleWorks. The UltraMacros manual describes how to personalize the macros in this file. For example, the manual suggests that you replace Heather Brandt's name in the <sa-N> macro with your own. *[Ed: Heather is Randy Brandt's daughter.]*

As you become comfortable with UltraMacros, you will discover ways to personalize and enhance the macros in the default set. This month's article describes three ways to enhance those macros.

Improved Page Calculations

The <sa-K> macro in MACROS. ULTRA3.0 calculates page breaks and lets you specify the page you want to display. Unfortunately, this macro leaves you guessing how many pages are in the document and what page number to specify.

Leonard Warchol of Killeen, Texas modified the macro so it displays the last page when it stops. You then know the number of pages in the document and are better able to determine the page number to specify. Mr. Warchol's macro also eliminates the "Find next occurrence?" question that appears after you execute the

Figure 1: Macros that Calculate Page Breaks

```
Original macro:
K:<awp><oa-K : rtn : oa-F>P!

Modified macro:
K:<awp><oa-K : rtn : oa-9 : oa-F>P<input : rtn : rtn>!
```

Figure 2: Macros that Save Desktop Files

Figure 2A: Original <ba-ctrl-s> Macro

```
<ba-ctrl-S>:<all : { Define the macro; requires <ba-ctrl-t>   }
                   { subroutine.                               }
y = peek $C54 :    { Get Desktop Index number of current file. }
goto ba-ctrl-T>!   { Go to the <ba-ctrl-t> subroutine.         }

<ba-ctrl-T>:<all : { Define the subroutine.                    }
oa-Q :             { Display the Desktop Index.                }
down : rtn :       { Select the second file on the list.       }
oa-S :             { Save that file.                           }
x = peek $C54 :    { Check Desktop Index number of that file.  }
if x = y then stop : { Stop if you are back to original file.  }
else rpt>!         { Otherwise, go to the next file on the     }
                   { Index and save it.                        }
```

Figure 2B: AppleWorks 3.0 Smart Save Macro

```
<ba-ctrl-S>:<all :  { Define the macro.                        }
oa-Q : esc          { Go to the AppleWorks Main Menu.          }
>4<rtn :            { Select #4, Remove files from desktop.    }
oa-right :          { Select all the desktop files.            }
oa-rtn :            { Smart save all new and changed files     }
                    { before removing.                         }
oa-Q>!              { Return to the Desktop Index screen.      }
```

Figure 3: Macro that Numbers Cells

```
F:<asp>:
<oa-V>RFM<
msg ' Go to first cell and press Return ' :
input : posn W, X :
$1 = " " + screen 1, 22, 5 :
$3 = " First cell:" + $1 + ' Go to last cell and
press Return ' :
msg $3 :
input : posn Y, Z :
$2 = screen 1, 22, 5 :
U = 0 :
if W = Y then U = 1 :
else :
if X = Z then U = 2 :
endif :
if U = 0 then $3 = $1 + " and " + $2 + " are in
different rows and columns " :
msg $3 : bell : stop :
else :
if U = 2 then V = Y - W + 1 :
else :
V = Z - X + 1 :
endif :
begin :
print V : V = V - 1 :
if V = 0 then rtn msg "" : stop :
endif :
if U = 2 then left rpt :
else :
up rpt>!
```

original <sa-K> macro. The original and modified macros appear in *Figure 1*.

"Smart Save" All Files

MACROS.ULTRA3.0 includes a macro that saves all the desktop files onto the current disk (see *Figure 2A*). Unfortunately, that macro does not save the files back to their original disk or directory.

The replacement macro in *Figure 2B* saves all new and changed files to their proper directories, removes all files from the desktop, and displays the Desktop Index. You can change the "4" to a "3" in the line ">4<rtn : " and the macro will save all files on the desktop without removing the files from memory. This macro gets its power from the <oa-rtn> keystroke described in Randy Brandt's article in the January 1990 issue of the ***AppleWorks Forum***. The use of <oa-rtn> in *Figure 2B* saves a significant amount of macro code that appears in the longer macro in *Figure 2A*.

Enter Consecutive Numbers

Sometimes a small change in a default macro has a significant effect on its operation. For example, the default macro set includes a macro that automatically inserts consecutive numbers in the rows or columns of a spreadsheet. Unfortunately, this macro executes slowly because AppleWorks recalculates the entire spreadsheet each time it fills a cell with a consecutive number.

The modified macro first sets recalculation to manual and thus accelerates the process. The only modification necessary is to insert the code "<oa-V>RFM" immediately following the macro definition. The <oa-V> calls up the spreadsheet Set standard Values Menu, "R" selects "Recalculation", "F" indicates "Frequency", and "M" specifies "Manual". The modified macro appears in *Figure 3*.

[William Neef is a retired purchasing agent for Welding Metals, Inc. and is Treasurer of the Apple Jackson (Mi) Users Group.]

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Tips for Better Data Base Design

by Dan Verkade

This is the fifth in a series of articles that describe how to use TimeOut ReportWriter. This month Mr. Verkade describes how to use a systems analysis approach to design your data base structure. He assumes that you read the previous articles in this series.

Now that you know how to create a report with ReportWriter, it is time to step back from the mechanics of reporting and look at the global issue of data base design. This month you will learn the steps to follow when designing an information management system. I will describe several business examples in this article, but the concepts I describe apply to schools, churches, and other organizations not usually considered businesses. I trust that you will be able to generalize my examples to your own applications.

The Systems Approach

The key to successful system design is to remember that your objective is to develop a data management system that provides the output necessary to run a business or organization. That goal requires a broad perspective. You must focus on the output you need, not on the data you collect. Ultimately, you will have to examine the flow of data in the entire organization.

"You must focus on the output you need, not on the data you collect."

An information system is often designed the way the data flows in the organization; that is, starting from the data sources and finishing with the report. The diagram in *Figure 1* depicts that flow.

However, I suggest that you develop your information system by working backwards. You should start by getting an understanding of the present and future information needs of the organization. Then let those needs determine the data you collect and store in your system. More specifically, your analysis should follow the flow that appears in *Figure 2*.

Let's examine the steps in that figure.

1. **Goal Definition**: Start by defining your goals. You need a broad understanding of your organization; where you want it to go and how it will get there. That should include a clear statement of your product or service, job descriptions for your key people, and a diagram of the flow of transactions and documents in your organization.
2. **Determine Report Users**: You have to know who needs access to the data. Some users need immediate on-line access, others should not have that access. Many users will need printed reports.
3. **Define Report Contents**: Meet as a group and individually with the people who need access to the data. Get samples of every report and form they generate or use in their work. Define "report" broadly so it includes all data they must see on the screen and all printed output they produce. Don't forget "reports" such as invoices, transfer slips, and the like. Discuss the strengths and weaknesses of each report and additional data the user needs but is not getting. Annotate your copy of each report.
4. **Define Data Needs**: Now you will decide what data you must store in the system. Start by listing all the data needed for the reports. You will have to collect and store or compute each category that appears in any report.

   Then consider other unmet needs and future expansion. What data will you need in the future? Be careful in this process. It takes time and effort to enter and maintain the data files; it is all

Figure 1: Data Flow

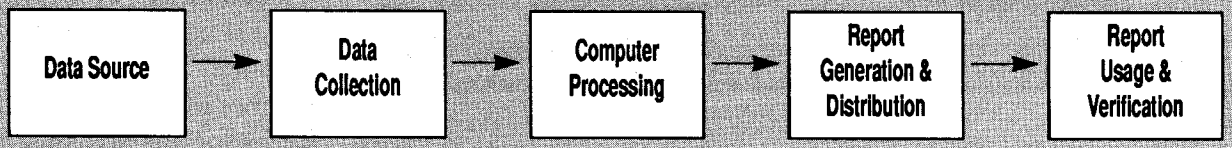

Figure 2: Data Base Design

too easy to design a system that collects and stores data that you will never need. If necessary, meet with your users to ensure they understand the data that will be available and try to determine if there is a high probability that they will use the data.

Remember that you will also need reports to help with your decision making. For example, you need to maintain financial data to track the financial health of your organization. You might need other reports to analyze pricing, sales mix, and strategy. For example, inventory reports will help maintain your inventory or manufacturing schedule.

Often you do not need a computer to store the information you need. For example, a check register or a report from your accountant will often serve your financial data management needs. A small organization or business can waste more time collecting, maintaining, and reporting data than the data is worth.

5. **Data Source Analysis**: Now you must determine the source of each data element. Where will you get the data for each category in your data base system?

   You must also plan a way to collect and enter the data into the computer. This can involve direct entry (e.g., a secretary can enter student data directly into the computer as a student enrolls) or secondary entry (where a person fills out a form and someone enters the data later).

   Your data collection process must be efficient and timely. Remember that data loses much of its usefulness as it gets old and that some documents need to be processed immediately (such as incoming checks that need to be deposited).

   Your data collection system might receive some interim steps before you enter the data into the computer. For example, you might have to complete a receipts register where you record all incoming payments. Similarly, you may need to complete a demographic information form required by a government agency.

   If you are not using direct data entry, make certain you have the forms necessary to collect the data you will enter into the system.

6. **Data Base System Design**: Now you must design the computer data file structure. Good file structure provides room for all the data required for your system and streamlines data entry. Here are some suggestions to consider:

   A. Your data base will contain a series of related files. Each file should have a single major purpose or application. For example, businesses should develop a file with information about each customer. Schools should set up a file with demographic information about each student.

   B. Design your files so there is one record for each "transaction". For example, design an order entry system so each record contains an individual order.

Figure 3: Comparison of Referrals File Formats

Figure 3A: Referrals File with Separate Records

Student #	Date	Referred	Reason
581-382	3/16/89	Bennett	Broken window--warning letter home
581-382	4/15/90	Bennett	Fight w/ LaBenne--suspended 2 days
581-382	9/28/90	Wilson	Fight w/ O. Greene--suspend 2 days

Figure 3B: Referrals File with a Single Record

```
Date 1: 3/16/89
Referred by 1: Bennett
Reason 1: Broken window-warning letter sent home
Date 2: 4/15/90
Referred by 2: Bennett
Reason 2: Fight w/ LaBenne-suspended 2 days
Date 3: 9/28/90
Referred by 3: Wilson
Reason 3: Fight w/ O. Greene-suspend 2 days
Date 4:
Referred by 4:
Reason 4:
```

Consider this example: A data base file you establish to track student referrals for behavioral problems. You should design the system so each record contains a different referral. If Jack Anderson (student #581-382) is referred to a counselor three times, the referral file should include three records, like the example in *Figure 3A*. I suggest that you not follow the model in *Figure 3B*, which stores all the referrals in a single record.

The single-incident-per-record approach in *Figure 3A* makes it easy to search for a particular incident or to collect all the referrals by a specific teacher. If you keep all the referrals in a single record you must check all four referral categories for a specific incident. In addition, the single-incident-per-record approach ensures that you will not run out of categories.

C. Make certain that a common element exists between every two files you want to relate. The common element defines the relationship.

D. Avoid duplication of data. If data already exists in a file, use a relationship to report the data instead of re-entering the data in a second file. For example, there is no need to include a customer's address and phone number in both a customer information file and an accounts receivable file. Instead, use a relationship based on the customer code to get the address from the customer information file when you generate a report. This saves file space, speeds up the data entry process, and makes it easier to update your files.

7. **Report Design**: Now it is time to develop the reports. This is the nuts and bolts part of the process and requires a clear understanding of both your data base management program and your report generator. Recognize, however, that you have finished the difficult and important design effort necessary to make the system work. No matter how easy it is to use a report writer or how detailed and complex your final report, your work is only valuable if you can produce concise, informative, easy-to-read reports.

Conclusion

An old proverb says that nothing worthwhile ever comes cheaply. This concept extends to generating useful reports. Only by doing your homework and laying the necessary groundwork will you reap a reward from your data base management and reporting system.

[Dan Verkade is the developer of TimeOut ReportWriter, DoubleData, and other popular AppleWorks enhancements.]

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RamFAST: Speeds Up Hard Disks but Not Recommended

By John Link

The RamFAST is a hard disk controller card that dramatically improves the performance of SCSI hard drives with Apple IIGS or unaccelerated Apple IIe computers.

The RamFAST achieves its speed by using Direct Memory Access (DMA) techniques on DMA-compatible systems (such as the Apple IIGS), and by incorporating a 10 megahertz coprocessor and a 256K DRAM cache on the RamFAST board. As a result, the RamFAST loads AppleWorks into memory five times faster than any other SCSI card available for the IIGS. The RamFAST also offers a 50% improvement when loading GS/OS programs such as AppleWorks GS.

Although the RamFAST is compatible with the Apple IIe, it has significant limitations when used with IIe systems. See the sidebar entitled "RamFAST and Apple IIe Computers" for a discussion of those problems.

How RamFAST Works

The RamFAST performs disk accesses without any help from the Apple IIGS microprocessor. Thus, the RamFAST can tell the IIGS that it will finish a disk access, and release the computer to do something else. For example, if you issue an Apple-S command on a RamFAST-equipped computer, AppleWorks will let you edit a document even though the hard disk light is on. Without the RamFAST, you must wait for the computer to completely save the file before you can return to the document.

The 10 megahertz RamFAST is much faster than the 2.8 megahertz IIGS, which contributes to the increased performance of the card. However, the most significant speed gain under ProDOS comes from the RamFAST's use of a memory cache in combination with DMA.

ProDOS normally accesses a storage device one block at a time. That is an inefficient procedure, so the RamFAST assembles those one block requests into its cache memory until they reach "chunk" size. Then the RamFAST executes them as a single group, which is a more efficient way to handle disk access. DMA then delivers the requested chunk into the computer's memory without involving the CPU.

Caching and DMA work together to yield performance under ProDOS that is truly stunning. Caching improves the efficiency of outgoing disk accesses; DMA makes delivery of the incoming data efficient. This lets the RamFAST use true 1:1 interleaving on any SCSI drive under ProDOS. As a result, disk access with the RamFAST is several times faster than with the Apple DMA card, which does not offer a cache to augment DMA under ProDOS.

By contrast, GS/OS automatically assembles its disk requests into "chunks", so there is no need for a cache on the SCSI card to get the full effect of DMA. Consequently, 16-bit programs such as AppleWorks GS do not benefit as much from the cache used by the RamFAST, and the Apple DMA card can use 1:1 interleaving under GS/OS. However, the advantages of 10 megahertz operation and background processing make the RamFAST about 50% quicker under GS/OS than the Apple DMA card.

RamFAST Utilities

The RamFAST comes with a complete set of utility programs that let you format, partition, and name a disk, set how long the RamFAST should wait for a drive to reach operating speed, set the size of the lookahead buffer, and lets users with multiple disk partitions decide how many partitions can be accessed under ProDOS. (That feature lets AppleWorks and other ProDOS 8 applications access

DMA Compatibility

Loading data into computer memory normally involves a lengthy series of operations by the computer's central processing unit (CPU). Direct Memory Access (DMA) technology saves time by bypassing the CPU and loading data directly into memory. However, for DMA to work, the computer's memory must be designed to be DMA compatible.

The memory on the motherboard of every IIGS is DMA compatible, as is Apple's IIGS Memory Expansion card. However, some third party products are only partially DMA-compatible or not compatible at all. DMA-compatible products include the GS Juice (by Ingenuity), GS Ram (Rev E or later) and GS Ram Ultra (by Applied Engineering), and the Chinook Technology RAM 4000. The GS Ram Plus is fully compatible for the first four megabytes but requires a special add-on board to make the last two megabytes compatible. Applied Engineering's RamKeeper is compatible if you have only one memory card installed and if that card is DMA compatible. Applied's TransWarp GS (ROM 1.5 and later) is fully compatible, but none of the accelerators currently available for the IIe work with DMA. Non-DMA-compatible products include the RamPack 4GS by Orange Micro and the MemorySaver by CheckMate Technology.

Fortunately, DMA techniques work if any part of the computer's memory is DMA compatible. Thus, the RamFAST can always use the memory on the IIGS motherboard, which generates remarkable speed improvements even when expansion memory is not DMA compatible.

more than the first two partitions of a large disk.) The RamFAST utilities can also query your drive for the drive mechanism's name, model number and serial number, the number of cylinders, sectors per track, and current interleave.

What RamFAST Does Not Do

Even with DMA, disk access always involves the CPU at some level, and some operations involve the CPU more than others. For instance, AppleWorks files expand when you load them onto the desktop and contract when you save them to disk. The RamFAST does not accelerate the expansion/contraction process. As a result, files that change size do not show as dramatic an improvement in loading and saving speed as those which undergo less processing.

This limitation also applies to pre-loading modules. Since the RamFAST is quicker than a RAM disk, there is no reason to pre-load the AppleWorks or AppleWorks GS modules. You will get better performance by loading only the kernel of these applications during launch and letting the RamFAST load the modules as you need them.

The Test Hardware

My test equipment includes an Apple IIGS equipped with four megabytes of memory and an Applied Engineering TransWarp GS card running at 6.25 megahertz. The system includes two hard drives; a high quality CDC/Imprimis 94221-3 Wren V system and a drive based around the popular Seagate ST277N mechanism. While the RamFAST performed faster with the CDC/Imprimis drive than the Seagate, the differences were not significant; I present only the results of my tests with the CDC/Imprimis mechanism.

My tests compared the performance of three SCSI cards: the RamFAST, the new Apple DMA SCSI card, and the older Rev C Apple SCSI Card. I also compared the performance of the RamFAST to the speed of a RAM disk on the IIGS.

The Tests

Benchmark tests provided with disk utility programs do not always correspond to the performance one sees in everyday work. In addition, the cache feature of the RamFAST invalidates some of the results generated by these utilities. Therefore, I used real world situations instead of utility programs to test the speed of the interface cards.

To isolate the differences between the cards, I tried to minimize the CPU processing in these tests. I left my TransWarp GS set at 6.25 megahertz for all tests, and I did not pre-load any AppleWorks or AppleWorks GS modules. I used large files to ensure that the RamFAST could handle files larger than its 256k cache. The spell checking test used a large word processing file to minimize the effect of errors in my timing. However, I made certain the file was not so large that AppleWorks had to divide the spell checking into segments, which involves

additional CPU activity. I conducted some tests under both GS/OS and ProDOS. A description of each test follows:

Test 1: Boot GS/OS until the ProSel-16 desktop appears on the screen. The boot process includes numerous Classic and New Desk Accessories.

Test 2: Use ProSel-8 under ProDOS to copy a 330K AppleWorks word processor file from one subdirectory to another on the disk.

Test 3: Use ProSel-16 under GS/OS to copy the same word processor file between subdirectories.

Test 4: Launch AppleWorks GS.

Test 5: Launch AppleWorks 3.0 with 30 Time-Out modules from ProDOS.

Test 6: Launch AppleWorks 3.0 with 30 Time-Out modules from GS/OS.

Test 7: Spell check a 5,492 word document with the AppleWorks 3.0 spell checker.

Test 8: Search both the main and custom dictionary for a word that is not in either dictionary.

Test 9: Load a 345K AppleWorks word processor file onto the desktop.

Test 10: Save a 345K AppleWorks word processor file to the disk.

Figure 1: Speed of RamFAST and Apple SCSI Cards

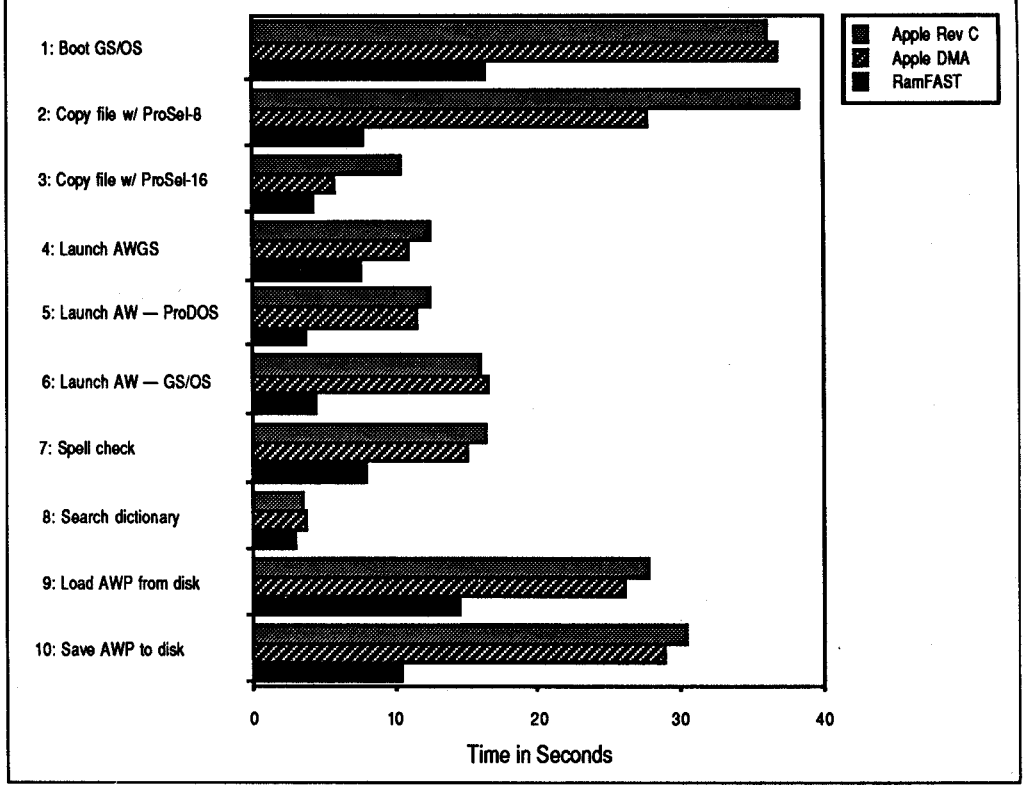
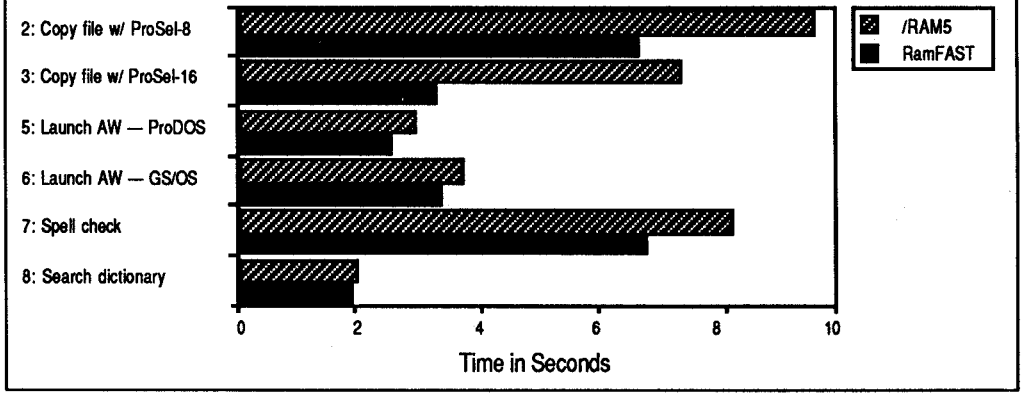


Figure 2: Speed of RAM Disk vs. RamFAST



The Results

Figures 1 and *2* summarizes the results of these tests. As you can see from *Figure 1*, the RamFAST is several times faster than either Apple SCSI interface card, particularly under ProDOS. This is especially important to AppleWorks users, since AppleWorks is a ProDOS application. For example, AppleWorks launches more than three times faster from a disk drive connected to a RamFAST card than from the same disk drive connected to an Apple High Speed SCSI card. AppleWorks spell check operations under the RamFAST were about twice as fast as the same operations run under the Apple card.

The RamFAST also improves hard disk performance under GS/OS, particularly during the boot

RamFAST and Apple IIe Computers

Unfortunately, there is a problem using RamFAST cards with Apple IIe computers. While the RamFAST is compatible with unaccelerated IIe systems, the DMA capability of the RamFAST is not compatible with the accelerator products available for these systems. Thus, the RamFAST manual suggests that you remove the accelerator from the IIe to get optimum performance. I disagree with that suggestion, because disk access accounts for less than one percent of the time spent using a computer, while an accelerator speeds up everything you do the other 99 percent of the time.

A second alternative is to turn off DMA on the RamFAST and leave the accelerator in place. This dramatically reduces the performance gain provided by the RamFAST and makes the extra cost of the RamFAST difficult to justify for IIe owners. As a result, I cannot recommend using a RamFAST with accelerated Apple IIe systems. If you do not own an accelerator and are making a choice between buying an Apple IIe accelerator or a RamFAST, I recommend the accelerator.

How to Get the Disk Testing Programs

NAUG's Public Domain Library now includes the "NAUG Hard Drive Test Disk" which contains "IOTest", the disk drive testing program developed by Walker Archer of Quality Computers, and "Tester", the program developed by John Link. The disk is available in both 5.25-inch ($4) and 3.5-inch ($6) format. Please include $2 s/h with your order. Our thanks for Mr. Archer and Mr. Link for their contribution of these valuable programs to our library.

up process. For example, my system booted GS/OS more than twice as fast when connected to the RamFAST than when connected to the Apple DMA card. Launching AppleWorks GS was one-third faster with the RamFAST than with the high speed Apple card. However, the gains under GS/OS are not as significant as those under ProDOS.

The RamFAST-equipped hard drive is so fast that I conducted several tests comparing my RamFAST-equipped drive with the RAM disk built into my IIGS. The results that appear in *Figure 2* clearly support CV Technology's claim that SCSI drives connected to the RamFAST card operate faster than a RAM disk.

Reliability

My tests of the RamFAST continued over four months and started with tests of early production cards. The first four cards I tested destroyed data on both of my test systems during ordinary use (see the sidebar entitled "Early Difficulties: The First Four Cards"). Initially, my fifth card (version 1.11) proved reliable. I tested this card in both day-to-day use and with two test programs which concentrate many months of normal use into a two day period.

The first test (developed by Walker Archer of Quality Computers) writes data to every block on a single volume under ProDOS, then checks the data for errors. This test ignores normal directory and file structures and tests the disk one block at a time. I ran this test for more than 44 hours on a 32 megabyte volume, which generated more than 20 million write/read checks. The version 1.11 RamFAST caused no errors during this test.

Then I tested the card with "Tester", a program I developed which uses standard directory and file structures. Tester checks the RamFAST's ability to write files with multiple blocks of data into complex directory structures under ProDOS. This test does not destroy data on the disk but requires about 8 megabytes of free space in which to operate.

Tester had the RamFAST read a series of master files and then created more than 210,000 copies, each of which was 41 blocks long. Tester checked each of the newly created files byte-by-byte for accuracy and found no errors.

Unfortunately, two weeks after completing these tests, some of the problems that plagued the first four cards reappeared and finally resulted in significant damage to the directory structure on my disk.

In addition, these tests did not uncover a problem that occurred when optimizing my test disk with the ProSel-16 optimizer.

I conducted a series of 75 optimizations of a 38,000 block volume, and six of these optimizations introduced serious defects into the directory

Early Difficulties: The First Four Cards

The RamFAST uses Dynamic Random Access Memory (DRAM) chips that must be "refreshed" every few billionths of a second with a small electrical impulse. Unfortunately, early versions of the RamFAST did not always refresh the DRAM chips often enough to preserve their contents. That caused data on my disks to become unusable after saving files and my hard disks soon became unbootable and performance declined dramatically.

My examination of the drives revealed that several key directory blocks had been remapped to physically remote locations on the drive's media surface. To restore the drive I had to perform a low level format, re-partition and re-initialize each partition, and finally restore the partitions with my backups. When I replaced the early RamFAST cards with an Apple SCSI card, there were no further problems, but when I re-installed the RamFAST cards the problems returned.

My fourth card included version 1.08 of the RamFAST ROM, which increased the DRAM refresh rate. I had significantly fewer problems with this version of the firmware, although I still experienced some data destruction and an assortment of lockups and crashes. CV Technology traced that problem to electrical "noise", which consists of spurious electrical signals of random frequencies and intensities which infiltrate the immediate environment.

The RamFAST is designed to work with memory chips capable of operating at 127 nanoseconds or faster (the smaller the number, the faster the chip). My fourth RamFAST was equipped with Samsung 120 nanosecond DRAM chips that tested out as 115 nano-seconds or better, well under the 127 nanosecond redline. The Samsung DRAMs are standard memory chips used in many IIGS memory products.

However, the RamFAST generates enough noise to cause about one in sixteen Samsung 120 DRAMS to malfunction intermittently, even though that same chip will work properly when installed on a standard memory card. Since there are eight DRAMs on every RamFAST, there is a 50% chance that a specific RamFAST using Samsung 120 chips will fail. Failure inevitably brings intermittent data destruction and other problems such as lockups. My fourth RamFAST was on the unlucky side of the 50-50 equation.

There are two solutions available to RamFAST owners experiencing these problems. The most obvious is to replace the Samsung 120 chips with chips that are not as sensitive to electrical noise. My fifth RamFAST, equipped with Fujitsu 100 nanosecond chips, has not caused any data destruction or lockups despite extensive testing, except when optimizing my test volume under GS/OS. If your Samsung-equipped RamFAST causes problems, you should contact CV Technology to find out about replacing its DRAMs.

Alternatively, the company can supply low power replacement parts for two noisy chips it used on early RamFAST cards.

For now, the safest solution is to replace noise sensitive DRAMs with less sensitive chips. If problems persist, replacing the noisy chips is the logical next step.

structure of the test disk. Fortunately, there was no physical remapping of key blocks, so I restored the disk from my backup. Optimization is a complex process and I cannot say with certainty that the RamFAST caused these failures. However, I optimized the same disk drive more than 100 times with Apple's SCSI cards, all without incident.

If you optimize your disk just once a month, this GS/OS disk optimization problem would occur on average about once a year.

Interaction with Other Peripherals

Unfortunately, I experienced other problems with the current card. For example, the RamFAST will not boot my system with my video digitizer card installed. This is puzzling because the first four cards, all of which exhibited serious reliability problems, accommodated the video digitizing card with no apparent difficulty. In addition, the digitizer does not affect the operation of the Apple SCSI card.

Four of the five RamFAST cards I tested (including version 1.11) will not recognize two SCSI drives connected to my IIGS when the SCSI ID is set to "5" on my CDC mechanism. Neither of my Apple cards has a problem with this drive's ID set to 5.

The Apple DMA SCSI Card: An Attractive Alternative

If you do not need the extra speed of the RamFAST, I recommend the Apple Hi-Speed SCSI card. The Apple card works reliably in a greater variety of hardware and software environments, with a greater number of peripherals, and with the entire range of SCSI devices, including flat bed scanners and CD-Rom drives. Both of my Apple cards are stable, reliable, and compatible with all my peripherals, though not nearly as quick as the RamFAST.

Conclusions

The RamFAST SCSI card is a high performance product that costs more than the Apple card, not because it does more, but because it does it faster. This performance boost is most noticeable when you use ProDOS applications such as AppleWorks. The increase in speed from the RamFAST is addicting; I was disappointed by how slow my hard disks seemed when I removed the RamFAST to test the other cards.

However, my experience with the RamFAST was disappointing because the cards proved unreliable. CV Technology worked on the source of the problems and my fifth card worked reliably for one month of intense use before I once again encountered damaged disk directory structures.

I cannot recommend the current RamFAST card to my NAUG colleagues. For me, the performance boost it provides is not worth the loss of reliability and potential damage to my data.

[John Link is a Professor of Art at Western Michigan University. He is the developer of SuperPatch and is an AppleWorks consultant.]

[The RamFAST card has a suggested list price of $289, and is available at significant discounts from mail order dealers. CV Technology, 1800 East Whipp Rd. #200, Kettering, Ohio 45440; (513) 435-5743.]

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What AppleWorks Does with Your Keystrokes

by Randy Brandt

This is the fifth in a series of articles that describe the internal workings of AppleWorks 3.0. These articles will help intermediate and advanced AppleWorks users understand why the program works the way it does. Mr. Brandt is one of the authors of AppleWorks 3.0.

As you sit before the AppleWorks screen awaiting the next idea for your Great American Novel, it is easy to think that the computer is resting; doing nothing because it is not manipulating the text you entered. But, like Type A personalities, computers do not rest well. Internally, more than a million operations continue to occur every second as the cursor blinks, awaiting your next keystroke.

Most of these operations involve hardware activities such as memory refreshes and screen displays. Others are software related; controlled by AppleWorks and any AppleWorks accessories you install that look for particular keystrokes.

In this article I will describe the software controlled operations that occur each time you press a key. Since TimeOut UltraMacros is universally accepted and makes major additions to these routines, I will include UltraMacros in the description.

Like most large programs, AppleWorks handles its operations by calling a series of routines. *Figures 1* and *2* provide an overview of the dozens of operations that occur while AppleWorks waits for and processes your keystrokes. Here are brief summaries of the most important routines.

ReadKB (Read Keyboard)

ReadKB is the main keyboard routine that AppleWorks activates whenever the program is ready to accept another keystroke. ReadKB checks all keystrokes for a non-text key combination (for example, Apple-Escape, which activates TimeOut), converts UltraMacros output into keypress equivalents, and passes all "normal" keystrokes onto StrobeKB. ReadKB also calls the subroutines that manage AppleWorks' inserting and overwriting cursors.

ReadKB2 is the secondary entry point to ReadKB. AppleWorks uses ReadKB2 when it needs to restart portions of ReadKB.

The following notes explain the annotations in ReadKB:

A. Buffered keys are stored in the type-ahead buffer. I described the type-ahead buffer in the previous article in this series.

B. AppleWorks stores the current screen character so it can create the illusion of a blinking cursor by alternating the character with another symbol. The strikeover cursor uses an inverse of the current character; the insert cursor uses an underscore character. Again, I described this process in the previous article.

C. An example of UltraMacros getting input is the <getstr> command, which prompts the user to enter keystrokes under macro control.

D. Any macro you activate can generate the keystrokes for AppleWorks.

E. "Exit with a keystroke" takes the key back to the calling routine; that can be from AppleWorks or from a TimeOut module.

F. Escape is the "trigger" to exit an AppleWorks or a TimeOut module. Since ReadKB converts the listed Open-Apple commands to Escape,

Figure 1: AppleWorks Read Keyboard Routine

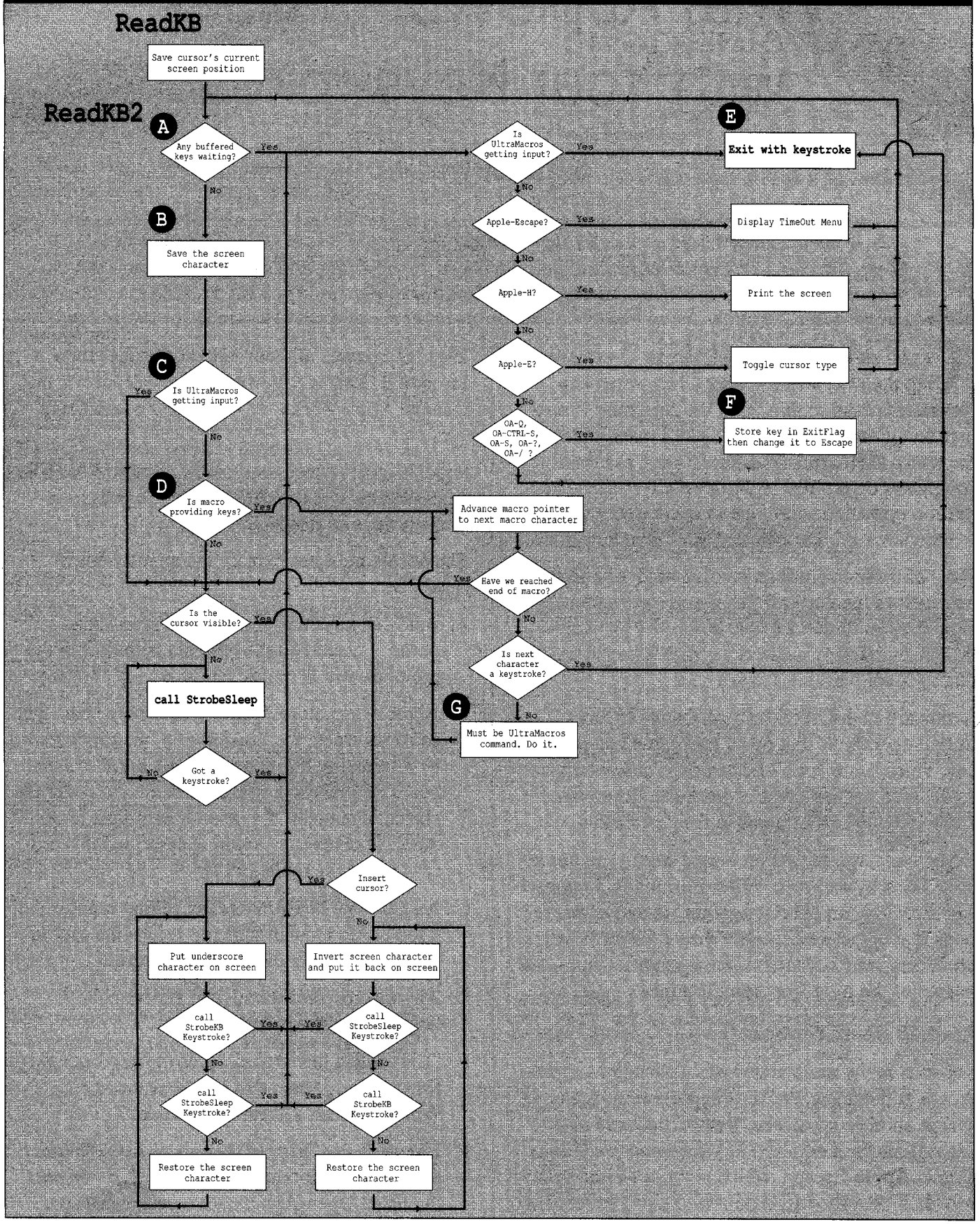
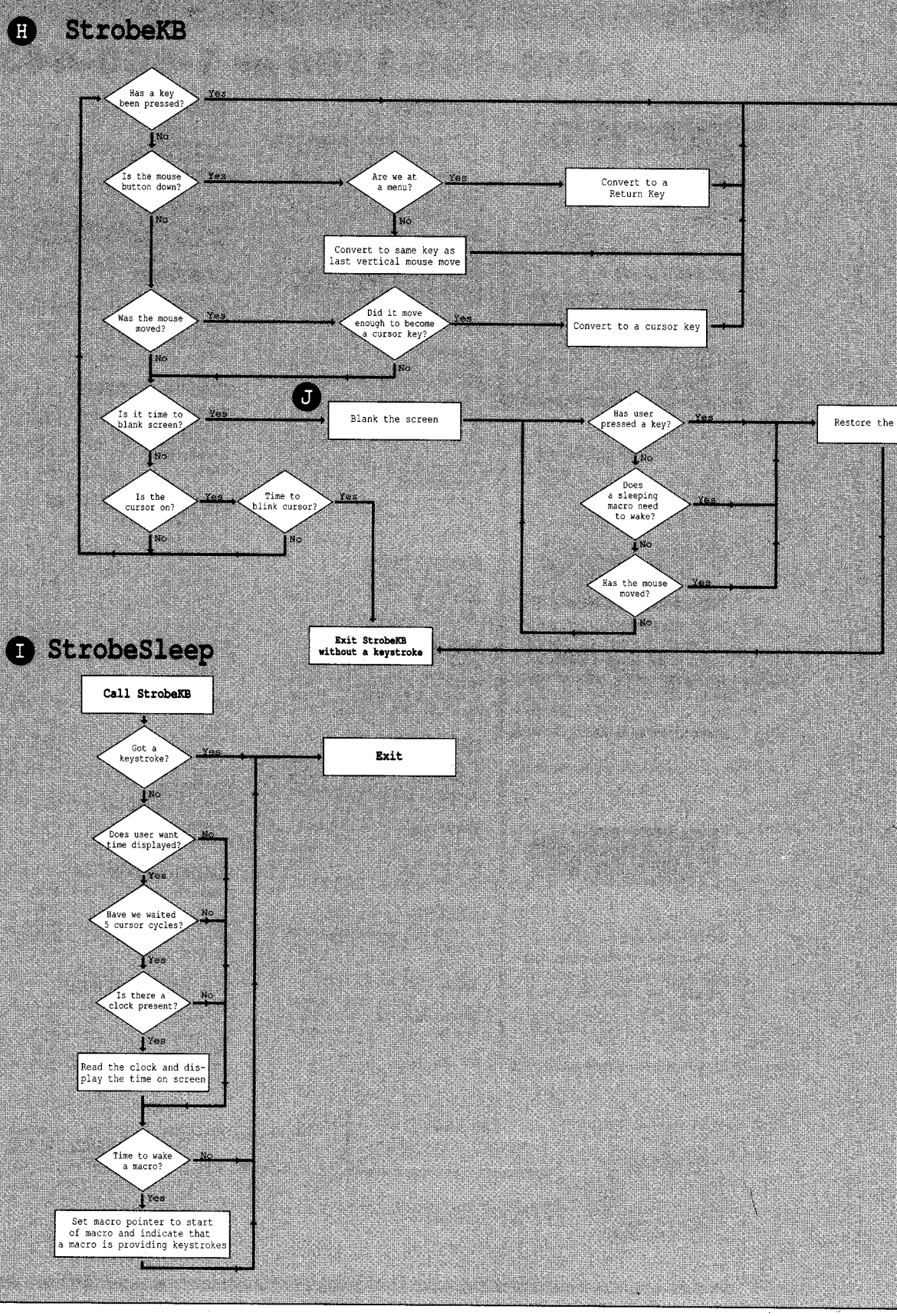
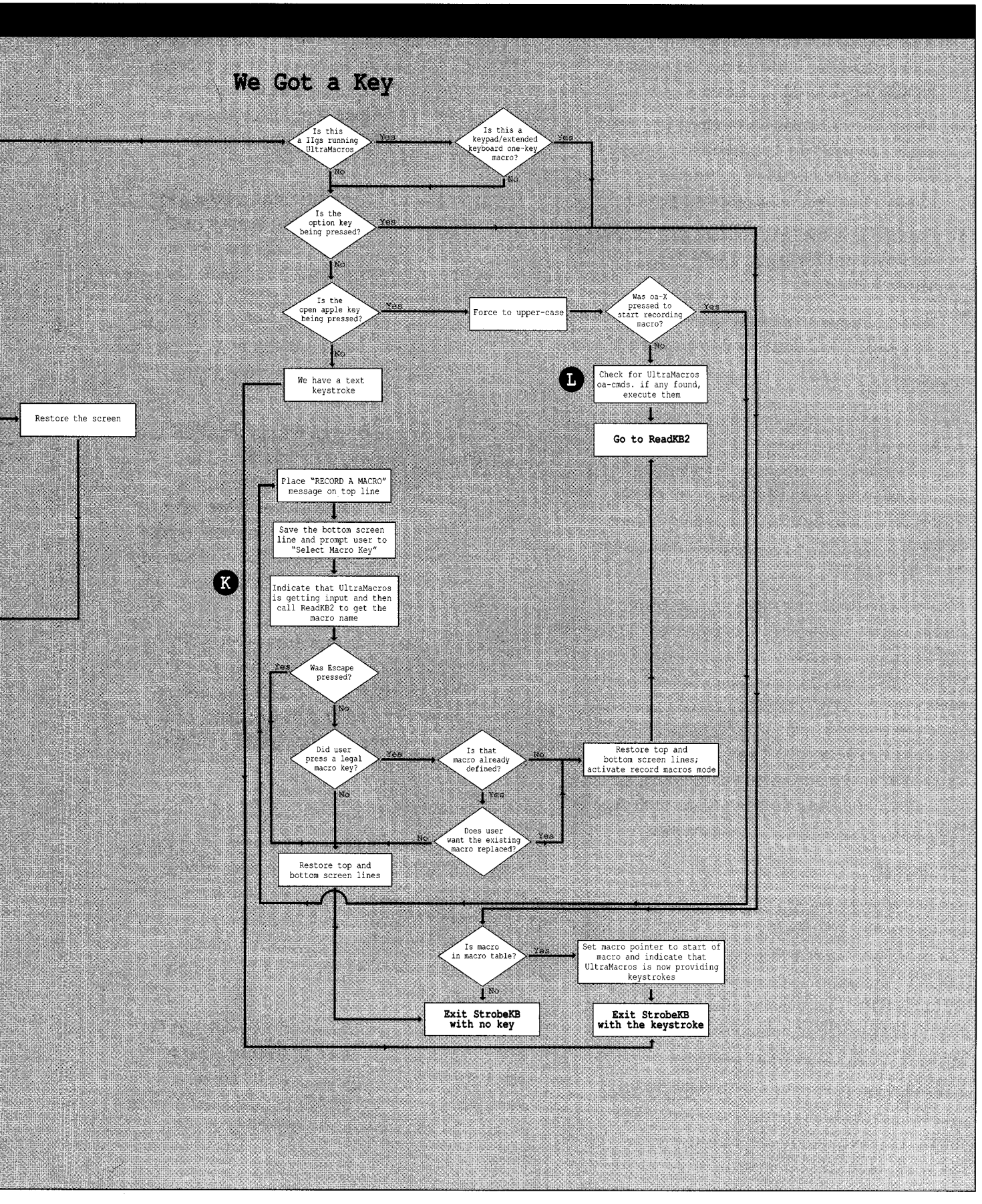


Figure 2: StrobeKB and StrobeSleep Routines




We Got a Key
Is this a IIgs running UltraMacros
Yes
Is this a keypad/extended keyboard one-key macro?
Yes
No
No
Is the option key being pressed?
Yes
No
Is the open apple key being pressed?
Yes
Force to upper-case
Was oa-X pressed to start recording macro?
Yes
No
No
L
Check for UltraMacros oa-cmds. if any found, execute them
Go to ReadKB2
We have a text keystroke
Restore the screen
Place "RECORD A MACRO" message on top line
Save the bottom screen line and prompt user to "Select Macro Key"
K
Indicate that UltraMacros is getting input and then call ReadKB2 to get the macro name
Was Escape pressed?
Yes
No
Did user press a legal macro key?
Yes
Is that macro already defined?
No
Restore top and bottom screen lines; activate record macros mode
No
Yes
Does user want the existing macro replaced?
No
Yes
Restore top and bottom screen lines
Is macro in macro table?
Yes
Set macro pointer to start of macro and indicate that UltraMacros is now providing keystrokes
No
Exit StrobeKB with no key
Exit StrobeKB with the keystroke

they exit cleanly and the Organizer can see what forced the exit by checking ExitFlag. It then calls the appropriate segment to handle the desired function.

G. Many UltraMacros commands (e.g., defining a variable) do not involve a keystroke. ReadKB processes the command and UltraMacros then waits for another keystroke.

H. StrobeKB is the core routine that checks the keyboard for input. I will describe StrobeKB below.

I. StrobeSleep manages the screen display of the clock. I will describe StrobeSleep below.

StrobeSleep

Unenhanced versions of AppleWorks include a skeleton of StrobeSleep that just calls StrobeKB. UltraMacros enhances StrobeSleep so it can manage the UltraMacros clock display. StrobeSleep can then update the on-screen clock and can check for sleeping macros that need to wake up.

StrobeSleep reads the clock by executing a ProDOS Get_Time call. UltraMacros displays the clock on the screen and tells StobeSleep to check the clock. However, the StrobeSleep routine does not manage the relationship between your clock and your computer; that is a standard ProDOS call. Thus, clock compatibility problems are an issue between ProDOS and your clock and have nothing to do with AppleWorks or AppleWorks enhancements.

StrobeKB

StrobeKB is the routine that actually tests the keyboard. The routine does the read with a 6502 "LDA $CØØØ" instruction (which is pronounced "load a c thousand"). That means that the A register (the CPU's equivalent of a variable) loads from location $CØØØ, which is where the hardware places any keystroke it detects.

UltraMacros adds the branch to this routine that checks for and controls mouse movements. (Unfortunately, the mouse routines do not work correctly on most IIc's and IIe's. That has been a frustrating problem for me; if I find a solution I will update UltraMacros for the affected users.) The bulk of StrobeKB determines what to do with normal keypresses. That segment of the routine first identifies Solid-Apple and Open-Apple keypresses and then passes regular keypresses onto AppleWorks.

J. StrobeKB uses two different routines to blank the screen. Blanking is easy on the IIGS; the routine changes the text, background, and border colors to black. On a IIe or IIc, the routine saves half the screen to the desktop memory and replaces all those characters with spaces. Then it switches the screen to a forty column display, thus blanking the screen.

K. Calling ReadKB from within ReadKB is a "recursive technique". This procedure works because ReadKB checks if it is being called by UltraMacros. That avoids some potentially disastrous situations like having ReadKB call ReadKB continuously in a closed loop with no possible way to recover.

L. UltraMacros adds numerous Open-Apple commands to AppleWorks including OA-! to force an insert cursor, OA-; to change the current character to lower case, and OA-- to read the current line or cell into macro Ø.

Conclusion

You will have to study the diagram in *Figures 1* and *2*. Those figures tell you a lot about what happens within AppleWorks, but I expect they will raise as many questions as they answer. Send me those questions: Inside AppleWorks, **NAUG**, Box 87453, Canton, Michigan 48187.

[Randy Brandt, an author of AppleWorks 3.0, is the developer of TimeOut CelLink and many other AppleWorks enhancements. He also owns JEM Software, publishers of AppleWorks enhancements such as DoubleData and FlexiCal.]

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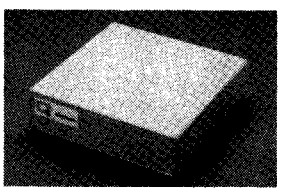

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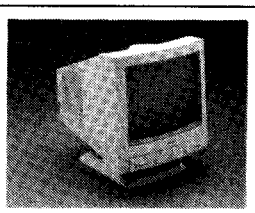

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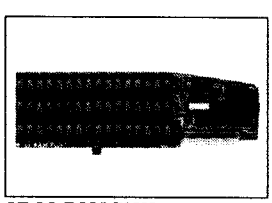

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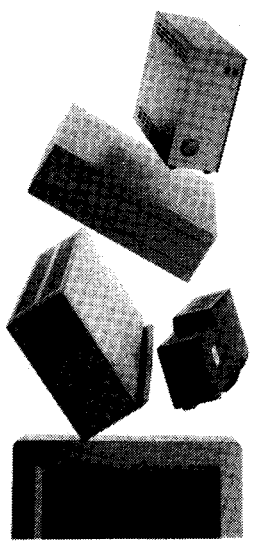

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Late News and Special Offers

NAUG

ProSel is a popular disk management program that offers menu driven program selection and a complete set of file and disk utilities. In addition to the standard copy, rename, lock, and unlock functions, the ProSel utilities support block editing, disk optimization, backup and restoration, and disk repair.

ProSel-8 is designed for Apple IIe and IIc computers; version 4.0 is current. ProSel-16 is a 16-bit program that runs on Apple IIGS systems; version 8.54 is current. Glen Bredon, author of ProSel, regularly updates and enhances these programs; the newest version of ProSel-16 includes an appointment calendar and scientific calculator.

NAUG members who own ProSel-8 or ProSel-16 can now get upgrades to the latest version of these programs from **NAUG**'s Beagle Buddies. Each upgrade costs $10 and includes return postage plus payments to the program's author and distributor. The Beagle Buddies are:

Bruce Shanker, 1279 Boyd Road, Warminster, Pennsylvania 18974-2260.

Oliver Roosevelt, 175 Gordon Drive, Spartanburg, South Carolina 29301 (please note Mr. Roosevelt's new address).

Joe Connelly, 32148 Camborne Lane, Livonia, Michigan 49154.

Pete Ross, 35026 Currier, Wayne, Michigan 48184.

John Carson, 215 Cedar Avenue, Rosemere, Quebec J7A 2W5, Canada. (Note: The price of upgrading is $11.50 Canadian because of exchange rate differences and higher postal costs in Canada.)

On another topic: **NAUG** will host an on-line meeting in the Conference Room of the AppleWorks area on America Online from 9 - 10 pm EST on Sunday, November 18. This meeting will give members a chance to share thoughts about AppleWorks and offer suggestions and ideas to the group's leaders. Please join us on-line.

ActaSoft

ActaSoft recently announced the release of "Fun with AppleWorks", a 5.25-inch disk that demonstrates the power that TimeOut UltraMacros adds to AppleWorks. The disk includes two games that run within AppleWorks and are programmed entirely in UltraMacros. An article on the disk describes how to display mousetext characters within AppleWorks word processor documents. The disk also includes a demonstration of AlphaCheck, ActaSoft's accounting program that works within AppleWorks. Requires AppleWorks 3.0 enhanced with TimeOut UltraMacros 3.1 or later. Fun with AppleWorks costs $6 plus $1.50 s/h.

[ActaSoft, 19700 Wells Drive, Woodland Hills, California 91364; (818) 996-6731.]

Apple Computer

Apple Computer recently released *The Apple II Guide*, a 240-page book filled with articles of interest to Apple II users. *The Apple II Guide* includes technical articles about networking and data exchange, troubleshooting, GS/OS, and an overview of popular Apple II applications such as AppleWorks, video production, hypermedia, and telecommunications. The book also includes Apple product information, a list of Apple dealers who expressed a commitment to the Apple II market, books, publications, electronic media and organizations that support the Apple II system.

The Apple II Guide has a suggested retail price of $19.95. However, until February 1, 1991 **NAUG** members can get *The Apple II Guide* for $4 plus $2 s/h directly from **NAUG**. Send your order to: Apple II Guide, **NAUG**, Box 87453, Canton, Michigan 48187. Visa, MasterCard, and purchase orders are accepted; payment must accompany all purchase orders. Foreign orders by credit card only, postage is additional; please specify air or surface delivery.

Educators with access to Macintosh computers can get a free copy of Educator HomeCard, a teacher productivity tool that runs under HyperCard 2.0.

The four disks contain a collection of HyperCard stacks grouped into three categories: Classroom management; lesson planning and scheduling; and miscellaneous resources (including clip art, sample data bases, and ideas for using HyperCard for instruction). Educator HomeCard requires a Macintosh computer with a hard disk drive. The package includes HyperCard 2.0.

To get a free copy of Educator HomeCard and HyperCard 2.0, send your name, title, school, address, and phone number to Intellimation, 130 Cremona Drive, Box 1922, Santa Barbara, CA 93116-9954.

Beagle Bros

Beagle is now shipping TeleComm 1.2, TextTools 1.2, and ReportWriter 2.5. **NAUG** members can get updates to the new versions from any of **NAUG**'s five Beagle Buddies (see page 31 for the names and addresses of **NAUG**'s Beagle Buddies).

Beagle recently released a new manual for TimeOut TeleComm version 1.2 that significantly improves upon the original documentation. Telecomm owners can get the manual directly from Beagle for $5. You must include the cover of your original TeleComm manual with your payment; Beagle will not accept photocopies.

[Beagle Bros, 6215 Ferris Square, Suite 100, San Diego, California 92121; (619) 452-5500.]

Charlie's Appleseeds

Charlie's Appleseeds now distributes attractively formatted, printed copies of the ProSel-8 and ProSel-16 documentation. The 50-pages of ProSel-8 documentation costs $7.50. The 103-page ProSel-16 documentation costs $10. All prices include postage.

[Charlie's Appleseeds, 9081 Hadley Place, San Diego, California 92126; (619) 566-1297.]

Chinook Technology

Chinook Technology's RAM 4000 is a memory expansion card for Apple IIGS computers. The card uses 1-megabyte RAM chips, is DMA compatible, and is user upgradeable to 4-megabytes of onboard memory. The card complies with Apple Computer's design and construction standards for enhanced Apple IIGS memory.

The 1-megabyte card regularly retails for $149. However, until December 31, **NAUG** members can buy the RAM 4000 directly from Chinook for $124.95 plus $3 s/h.

Chinook also announced special **NAUG** member prices for memory chips. Until December 31, **NAUG** members can get 1-megabyte of 1-megabyte RAM chips for $54.95 (list price is $69.95) and 256K of 256K RAM chips for $19.95 (list price is $27.95). The 1-megabyte chips fit RAM 4000, GS RAM Plus, GS Juice Plus, and many other memory expansion products. The 256K chips fit most older memory boards.

Chinook accepts Visa and MasterCard and will accept telephone orders. Ask for the special **NAUG** member price and provide your **NAUG** member number from the address label on this issue of the ***AppleWorks Forum*** when you place your order.

[Chinook Technology, 615 Main Street, #635, Longmont, Colorado 80501; (800) 999-7034.]

Claris Corporation

In appreciation of **NAUG**'s on-going support for the AppleWorks community, Claris Corporation recently authorized **NAUG** to distribute a limited number of discount coupons that let members purchase AppleWorks 3.0 for $99 (list price $249) and AppleWorks GS version 1.1 for $129 (list price: $299). For a free coupon, send a self-addressed, stamped envelope to Claris Offer, **NAUG**, Box 87453, Canton, Michigan 48187.

There is a limit of one coupon for each product per member. The coupons can only be used for programs delivered in the United States.

NAUG members who own earlier versions of AppleWorks and AppleWorks GS should use Claris' upgrade program. Upgrades to AppleWorks 3.0 cost $79, plus $3 s/h. Upgrades from any version of AppleWorks Classic to AppleWorks GS 1.1 cost $99. Upgrades to AWGS 1.1 from earlier versions of AppleWorks GS cost $29. If you have your original disks, contact Claris at (800) 544-8554 and request an AppleWorks upgrade packet.

Claris recently announced publication of the second edition of *The AppleWorks Resource Guide for Teachers and Parents*. The *Resource Guide* in-

cludes more than 100 pages filled with ideas and ways to use AppleWorks and AppleWorks GS to teach mathematics, science, social studies, and language arts to elementary and secondary school students. The *Resource Guide* describes more than 140 templates and includes sample lesson plans to help you develop instructional activities and units.

The AppleWorks Resource Guide for Teachers and Parents has a suggested retail price of $20. However, until January 31, 1991, **NAUG** members can get this valuable publication directly from Claris for $15. To order, submit the form that appears on page 17 of this issue of the ***AppleWorks Forum*** to Claris Software, Box 526, Santa Clara, California 95052. Allow 3-4 weeks for delivery. This offer is valid only for delivery in the United States.

[Claris Corporation Customer Relations, (408) 727-8227.]

InSync Software

InSync Software is now shipping version 2.2 of ProTERM, a popular Apple II telecommunications program formerly distributed by Checkmate Technology. In addition to the normal communications features, ProTERM offers a scrollback feature that lets you review the communications session on or offline, macros, sequential dialing that checks a series of telephone numbers until it makes a connection, auto-learn macros that memorize your keystrokes, VT-52 and VT-100 terminal emulation, split-screen chat mode, and XModem, YModem, ZModem, and Kermit file transfer protocols. ProTERM has a suggested list price of $129.95 but is available from mail order dealers at significant discounts.

Between November 1 and December 31, **NAUG** members can get a $15 rebate on ProTERM. To get the rebate, send InSync the warranty card, a copy of your dated sales receipt, and a copy of the back page of this issue of the ***AppleWorks Forum***, which includes your mailing label.

Owners of earlier versions of ProTERM can get the version 2.2 disks for $10 or the complete version 2.2 package including the manual for $35. InSync urges users to get the fully revised manual that describes the features of version 2.2. Include your original disks with your upgrade order.

[InSync Software, 3035 E. Topaz Circle, Phoenix, Arizona 85028; (602) 992-5515. Technical support: (602) 992-1345.]

JEM Software

I.O. Silver is a game of strategy and skill. You build a fourth generation supercomputer while racing the clock and battling bugs. Turn off the clock and killer bugs and I.O. Silver becomes an engrossing puzzle that inCider magazine called "one of the most ruthlessly addicting games in years".

Until December 31, **NAUG** members can buy I.O. Silver directly from JEM Software for $15 including shipping (list price: $20). Include your **NAUG** member number with your order. Colorado residents must add sales tax.

[JEM Software, Box 1500Q, Arvada, CO 80001.]

Marin MacroWorks

Marin MacroWorks announced the release of UltraAWesome Macros, a collection of more than 400K of exceptional macros prepared by Will Nelken. Macros in this collection include Add Files Menu (which makes it easy to add files to the desktop from any subdirectory on your disk), Batch Filer (which offers a file card menu that lets you save or remove all files on the desktop, or print all files, and quickly exit AppleWorks), Box Drawing Tool (which automates the drawing of squares and rectangles within word processor documents), FileCard Menu Construction Kit (which makes it easy to create filecard menus), Grammar Checker (the excellent grammar checking macros on **NAUG**'s Grammar Checker disk), Greeting Card Maker (which produces Print Shop-style greeting cards from AppleWorks), ImageWriter Printer Functions (which lets you access many of the features available on the ImageWriter), Macro Reference Kit (a toolkit for macro writers), Save Files Menu (which lets you save files to any subdirectory on your disk), and SuperFonts Printing Menu (which makes it easy to use any SuperFonts function). UltraAWesome Macros requires AppleWorks 3.0 enhanced with UltraMacros 3.1.

UltraAWesome Macros retails for $19.95. Until December 31, **NAUG** members can buy UltraAWesome Macros directly from the publisher for $17.50 plus $2.50 s/h. Indicate whether you want 5.25-inch

or 3.5-inch disk versions of the macros. Include your NAUG member number with your order.

[Will Nelken, Marin MacroWorks, 1675 Grand Avenue, San Rafael, CA 94901; (415) 459-0845.]

Quality Computers

Quality Computers recently introduced Q-Drives; 40-megabyte and 100-megabyte SCSI-compatible hard disk drives for Apple II, Macintosh, and MS-DOS computers. Q-Drives use Conner mechanisms with voice coil actuators for fast head positioning, and data buffering for quick data access. The drives come with a 30-day money back guarantee and a 1-year limited warranty. The 40-megabyte drive costs $599.95 with an Apple High Speed SCSI card or $699.95 with a RamFAST SCSI card. The 100-megabyte drive costs $999.95 and includes the RamFAST card.

Quality Computers also announced the release of version 7.0 of SuperPatch, a program that customizes AppleWorks. SuperPatch 7.0 contains more than 140 patches to AppleWorks 3.0, including 31 patches not available in earlier versions of this program. (SuperPatch 7.0 contains the same 150 patches for AppleWorks 2.x that are available on SuperPatch 6.1.) Twelve of the new patches enhance the functionality of AppleWorks 3.0. The remaining 19 patches customize the screen by changing messages and adding mousetext. SuperPatch 7.0 also enhances 11 patches that appeared in SuperPatch 6.1.

SuperPatch 7.0 lets you limit AppleWorks' desktop expansion to protect RAM disks, lets you tell AppleWorks where to look for its spelling dictionaries, lets you customize AppleWorks' preloading message, enhances the AppleWorks file card display and Desktop Index Menu with mousetext, disables the "delete files" and "create subdirectory" options (those are useful patches for teachers), lets you change the default zoom status in all three modules, and makes dozens of other enhancements to AppleWorks.

SuperPatch 7.0 has a suggested retail price of $39.95 and is available from NAUG for $25.95 plus $2 s/h. SuperPatch owners who bought the program after September 1, 1990 can upgrade to SuperPatch 7.0 at no cost by returning the original disk and a copy of the dated sales receipt to Quality Computers. SuperPatch owners who bought the program before September 1 and who returned their registration cards can upgrade to version 7.0 for $12 plus $3 s/h by calling Quality Computers.

[Quality Computers, 20200 Nine Mile Road, St. Clair Shores, Michigan 48080; (800) 443-6697.]

Seven Hills Software

Independence: Seven Hills Software will soon release Independence, a collection of GS/OS printer drivers that let you use HP DeskJet IIP and LaserJet printers with 16-bit programs such as AppleWorks GS, BeagleWrite, and GraphicWriter III. Independence lets you print any range of pages, or the even or odd numbered pages. (That lets you print double-sided documents.) Independence also offers auto-collation of multiple copies of multi-page documents and supports all different paper sizes available on these printers. The drivers let you scale the height and width of your output separately for more control of graphic output. You can print in either landscape or portrait mode, a useful feature for AWGS users who develop large spreadsheets. Finally, the program supports the DeskJet's draft mode which saves 50% of the ink by printing only half the dots in each character.

Independence, which will be available about November 15, has a suggested list price of $39.95. Until December 31, NAUG members can buy Independence directly from Seven Hills Software for $20. See the ordering details below.

Font Factory GS: Font Factory GS is a font editor that lets you create, modify, scale, and smooth fonts used by GS/OS programs such as AppleWorks GS. Font Factory GS makes it easy to add font sizes to the GS/OS Font Menu. You can use the larger fonts to improve the output you get from TimeOut SuperFonts, AppleWorks GS, and from most GS/OS word processor and page layout programs.

Font Factory GS, which requires an Apple IIGS with at least 768K of RAM, has a suggested list price of $39.95. Until December 31, NAUG members can buy Font Factory GS directly from Seven Hills for $20. See the ordering details below. Version 2.0 of Font Factory GS is current.

Disk Access: Disk Access is an Apple IIGS New Desk Accessory that lets you access all the functions available in the GS/OS Finder from within any program. Disk Access lets you format disks, create folders, copy, delete, rename, and verify files, folders, and disks from within any GS/OS application. Disk Access handles both the data and resource forks found in the extended files introduced with GS/OS 5.0.

Disk Access requires at least 128K of RAM available while you are running your application. (To check the available memory, access the Control Panel, highlight "RAM Disk" and press the Return Key.) If you do not have 128K, you can still use Disk Initializer ($12.50, including s/h) to initialize blank disks while you are using another program. Disk Access has a suggested retail price of $49.95. However, until December 31, **NAUG** members can purchase Disk Access directly from Seven Hills Software for $25. Version 1.0 is current.

Ordering: Seven Hills Software accepts **NAUG** discount orders by mail, telephone, or on America Online, GEnie, or CompuServe. The company's electronic address on America Online and GEnie is "SEVENHILLS". Their CompuServe address is 72437,3165. To get these special prices, give your **NAUG** membership number from the address label on this issue of the ***AppleWorks Forum***. If you order by mail, include a photocopy of the back page of this issue, including your mailing label. Seven Hills honors both Visa and MasterCard. Add $2.50 s/h *per order.*

[Seven Hills Software, 2310 Oxford Road, Tallahassee, Florida 32304; (800) 627-3836. Outside the U.S.: (904) 575-0566.]

Supra Corporation

Last month's issue of the ***AppleWorks Forum*** contained a special offer from Supra Corporation for the company's Apple II-compatible external 2400 baud modem for $109. Quality Computers and Roger Coats now sell that modem for $99; we suggest that members purchase the product from either company and not from Supra.

[Quality Computers, 20200 E. Nine Mile Road, St. Claire Shores, Michigan 48080; (800) 996-1508.]

[Roger Coats, Box 171466, San Diego, California 92197; (800) 438-2883.]

TeleCommunications

The major on-line communications services recently announced new pricing policies. Here are the current prices:

CompuServe: CompuServe now charges $6.30 per hour for 300 baud access and $12.80 per hour for 1200 and 2400 baud access. The company no longer charges premium fees for day-time users. These prices include telecommunications service on CompuServe's packet switching network. Telenet or Tymnet charges are additional. In addition, CompuServe charges a $1.50 monthly service charge.

GEnie: GEnie charges a $4.95 monthly basic membership fee that gives unlimited access during non-prime hours to more than 100 basic products and services including electronic mail, an on-line encyclopedia, single-player games, stock quotes, and news. Other GEnie services now cost $6 per hour during non-prime hours and $18 per hour during prime time. There are no additional charges for 1200 or 2400 baud access.

America Online: America Online now charges a $5.95 per month Membership Fee (which includes one hour of non-prime time usage), $5 per on-line hour during non-prime times and $10 per hour during prime times. There are no additional charges for 1200 or 2400 baud access. (Users who joined before March 1, 1990 get a 20% discount off the regular connect time rates. There is a 20¢ per hour surcharge for users from Alaska, Canada, or Hawaii.)

AlphaCheck Plus

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- Post to General Ledger
- Check Writing
- Cash Disbursement Journal
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Help with AppleWorks Utilities

by Nanette Luoma

Each month, the *AppleWorks Forum* lists the member-volunteers who offer technical support for AppleWorks products. This month's list identifies the volunteers who can answer questions about utility software for Apple computers. Next month's issue will contain a list of members who offer help with AppleWorks-compatible hardware and printers.

AppleWorks Utilities

How to Use This List

To the left of each volunteer's name are numbers indicating the utilities the consultant supports. Volunteers are listed alphabetically by state.

1 = ProDOS
2 = File Conversion
3 = Copy II+
4 = Disk/File Recovery
5 = ProSel
6 = EasyDrive

		City	Home	Work
Alabama				
3,6	Norma Gradwohl	Mobile	205-343-4905	205-343-4905
Arizona				
3	Clay Evitts	Tucson	602-885-9789	602-296-5491
California				
1	Dan Balsley	San Ramon	415-829-5085	
3	Brian Blue	Danville	415-838-0997	415-954-6002
1-5	James Davis	Hayward	415-489-7024	
3	Don Farrar	Pleasant Hill	415-932-5509	
1,5	David Gair	Los Angeles	213-469-9916	213-469-9916
1	Alan E. Kahn	San Anselmo	415-457-9827	
3	Wayne Kliman	Santa Barbara	805-967-3620	
3,5	Will Nelken	San Rafael	415-459-0845	415-456-1795
5	Jesus Orosco	Milpitas	408-270-1011	408-945-4344
Colorado				
1-5	Gary Armour	Littleton	303-933-9493	303-972-4665
3	Geoff Hollingsworth	Morrison	313-697-9277	
2,3	John Lefebvre	Thornton	303-451-5558	303-457-2852
1,3	John Loren	Littleton	303-978-0603	
1	Dr. Larry Thaete	Boulder	303-939-9072	303-492-2717
Connecticut				
5	Martin Knight	Middletown	203-346-9698	203-347-8594
1,3,5	Newton Shaffer	Gales Ferry	203-464-9716	
Delaware				
3	W. Henry Linton, Jr.	Wilmington	302-478-3740	
Florida				
1,3,4	H.Clay Bailey III	Jacksonville	904-744-2499	904-725-3477
3	Robert Booz	Port Richey	813-868-1802	
3	Ronald Stankiewics	Patrick AFB		407-494-2227
1-6	Jeff Strichard	Ft. Lauderdale	305-587-9590	
1-5	Mike Ungerman	Oviedo	407-366-0060	407-366-0156

		City	Home	Work
Illinois				
1-3	William Davis	Hinsdale	312-655-9142	312-887-1730
1-3	George Duffey	Bloomingdale	708-894-0849	708-451-3106
Indiana				
3	Jack Countryman	Greensburg	812-663-4998	
3	Kevin Gold	Indianapolis	317-290-8948	317-543-7098
3	Laura Kelley	Gwynneville	317-763-7290	
Iowa				
1,3	Keith King	Ft. Madison	319-372-9521	
1,3,5	Stephen May	Audubon	712-563-2925	712-563-4217
Kentucky				
2	Donald Corson	Louisville	812-256-3517	502-473-3083
Louisana				
1-3	Charles Fryling	Baton Rouge	504-766-3120	504-388-1473
Maryland				
3	Raymond Greenberg	Damestown	301-330-4912	301-353-4959
3	Ben Maser	Owings Mills	301-252-7884	301-887-0717
1-5	Ray Settle	Arnold	301-647-9192	301-887-0106
Massachusetts				
1,3	Donald McCabe	Westport	401-294-6256	508-636-2611
Michigan				
3	Jim Anker	Auburn Hills	313-391-0033	313-544-5344
1-3,6	Michael McMinn	Swartz Creek	313-655-4442	313-232-6541
1-5	Pete Ross	Wayne	313-728-8269	
3	Deborah Williams	Grosse Ile	313-671-0267	313-675-1550
Minnesota				
1-5	James Hirsch	Coon Rapids	612-421-8393	612-422-5572
3	David Johnson	Minneapolis	612-824-2728	612-824-2728
3	Dick Kenfield	Hopkins	612-938-4382	
1-4,6	Richard Marchiafava	Fridley	612-572-9305	
3	Peter Zambino	St. Paul	612-690-0536	612-489-1459
Missouri				
1,3,5	Whit Crowley	Manchester	314-394-7955	
1-4	Bob Suits	Columbia	314-445-6082	
Montana				
1-3	Steve Bernbaum	Sheperd	406-373-6393	
Nebraska				
5	Jim Corbin	Bellevue	402-291-7285	402-331-7312
1-4	Dr. John Kelley	Omaha	402-397-3485	
1-5	Larry McEwen	Hastings	402-463-2267	402-461-7550
Nevada				
1,3	Keith Johnson	Sparks	702-626-2543	702-784-4812

		City	Home	Work
New Hampshire				
3	Phil Kirkpatrick	Keene		603-352-0640
New Jersey				
2,3	Pete Crosta	Nutley	201-667-6369	201-677-4050
3	Link Keur	Augusta	201-875-2568	201-992-7000
1-5	David Scott	Wall	201-531-0600	201-531-4016
New Mexico				
3,5	Willis George, Jr.	Albuquerque	505-897-4886	505-883-9743
3	David Selwyn	Las Cruces		505-522-7622
1,2,5	Gary Young	Corrales	505-897-1770	505-897-1770
New York				
3	Bob Beer	Coram	516-928-6870	
1-3	Linda Doscher	West Nyack	914-358-7064	
3	David Gagnon	Gowanda	716-532-4870	
1,3	Carlos Madan	Morrisonville	518-562-0779	518-359-3322
3,5	Larry Merow	Sayville	516-567-0603	516-422-0315
1-4	James Nicoll	Pittsford	716-381-9480	716-546-6732
1-4	Terry Williamson	Orchard Park	716-662-5104	716-873-9750
North Carolina				
5	Marc Apfelstadt	Greensboro	919-282-1494	919-334-5970
Ohio				
1-5	Jason Chao	Cleveland Hts.	216-321-5451	216-844-3791
3,5	Don Fisher	Dayton	513-890-0428	513-461-2444
1,3,4	Jason Fogt	Lakeview	513-843-5779	
1,3	Carman Greco	St. Clairsville	614-695-5026	
1-3	Robert Netro	Canton	216-477-3667	
3,5	Ltc. Robert Weis	Beavercreek	513-429-4169	513-257-6836
Oklahoma				
3,5,6	Rev. Jerry Venable	Guymon	405-338-3723	405-338-3616
Oregon				
1-4	Jim Emig	Portland	503-771-1916	503-280-5666
1,3,6	M.W. Fox	Corvallis	503-754-7623	503-737-3628
1	Dave Lomax	Lake Oswego	503-636-7289	
Pennsylvania				
1,3,4	Claude Davis, Jr.	Stewartstown	717-993-6874	717-845-3571
1-4	Martin Friedman	Broomall	215-353-2753	
3	Richard Gable	Pittsburgh	412-963-6158	412-963-1128
5	William Hall	Philadelphia	215-824-1160	215-441-0800
1	Rivka Rosenkrantz	Philadelphia	215-464-4725	215-493-1800
3	Charles Schultes Jr.	Lehighton	215-377-5169	215-377-6180
1-4,6	Bruce Shanker	Warminster	215-674-0118	
5	Hal Shapiro	Eagleville	215-630-8936	215-922-0500

		City	Home	Work
Tennessee				
1,3	Jerry Bruce	Bristol	615-652-7473	703-676-2999
1-3	Bob Evridge	Knoxville	615-693-8817	615-693-9242
3	Joel Goldman	Nashville	615-352-3617	
Texas				
3,5	Larry Jones	El Paso	915-533-3302	915-565-3016
1,3-5	Joseph Kline	Lubbock	806-796-0829	
1-5	Ramon Merlin	San Antonio	512-496-5331	
Vermont				
1,5	Douglas Corey	Middlebury	802-388-6209	802-388-4021
3	Linda Metzke	Concord	802-748-3298	802-626-9371
Virginia				
1-4	Peter Pfeiffer	Herndon	703-437-1985	703-834-3618
Australia				
1,3,5	Dr. Jules Black	Bondi Junction	612-327-7501	612-389-8881
1,3	Ralph Morgan	Tweed Heads	075-369352	
Canada				
1,3,6	Michael Beebe		604-477-4630	604-721-7954
1,3	Patrick Duffy	Lethbridge	403-329-4211	
1,3,5	Jean Guy Mariage	Shannon	418-844-2932	418-844-5268
1,3	Terry Price	Schomberg	416-939-8104	
1,3,5	Robert Sutherland	Toronto	416-465-2945	
1-5	Nick Van Helsdingen	Tranquillity Base	604-296-3260	
England				
1,3,5	Terry Cymbalisty	Leeds	0532 525038	
3	Andrew Letchford	Plymouth	0752-766435	44752-766435
1,3,5	John Richey	Surrey	252-723993	71-409-0092
France				
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